

Accounting and Business Research

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Growth Model**

**Examining Investment Information Sources for Sophisticated
Investors Using Cluster Analysis**

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Implementation and Development**

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Market Perception of Goodwill: Some Empirical Evidence

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(25)

Accounting and Business Research

Volume 26 Number 1 Winter 1995

Contents

657-05 AC 27

Articles

The Cost of Equity Capital and a Generalisation of the Dividend Growth Model

D. J. Ashton 3

Examining Investment Information Sources for Sophisticated Investors Using Cluster Analysis

David Bence 19
Kevin Hapeshi
Roger Hussey

Accounting Reforms in China: Cultural Constraints on Implementation and Development

Lynne Min-ying Chow 29
Gerald Kun-kwai Chau
Sidney J. Gray

Commonalities Between Added Value Ratios and Traditional Return on Capital Employed

M. F. C. Kwong 51
J. W. Munro
K. V. Peasnell

Market Perception of Goodwill: Some Empirical Evidence

Mark G. McCarthy 69
Douglas K. Schneider

Book Reviews

C. W. Nobes and R. H. Parker, *Comparative International Accounting. Fourth Edition*

Peter Walton 82

Angelo Riccaboni and Rosanna Ghirri, *European Financial Reporting Series. Italy*

Stefano Zambon 83

Joanne Horton and Richard Macve, *Accounting Principles for Life Insurance: A True and Fair View?*

Rupert Yardley 83

John Pointon (ed.), *Issues in Business Taxation*

D. J. Ashton 85

Canadian Institute of Chartered Accountants, *Reporting on Environmental Performance*

Jan Bebbington 86

R. H. Parker and C. W. Nobes, *An International View of True and Fair Accounting*

Tom Lee 87

Forthcoming Articles

Thomas W. Hall, Keith A. Shriver and Mark Tippet, The Estimation of Monetary Gains and Losses in Diverse International Economic Environments

Wilson E. Herbert and R. S. Olusegun Wallace, A Corporate View of Research Needs in Corporate Finance

Cameron Hooper and Ken T. Trotman, Configural Information Processing in Auditing: Further Evidence

Terry J. Ward and Benjamin P. Foster, An Empirical Analysis of Thomas's Financial Accounting Allocation Fallacy Theory in a Financial Distress Context

Marleen Willekens, Anthony Steele and David Miltz, Audit Standards and Auditor Liability: A Theoretical Model

Mike Wright and Ken Robbie, Venture Capitalists, Unquoted Equity Investment Appraisal and the Role of Accounting Information

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Index to Volume 25—1994/95

ARTICLES (by author)

- Archer, Simon, Delvaille, Pascale and McLeay, Stuart; The Measurement of Harmonisation and the Comparability of Financial Statement Items: Within-country and Between-country Effects. 67.
- Baldwin, Trevor; Management Aspiration and Audit Opinion: Fixed Asset Accounting at the Staveley Coal & Iron Company 1863–1883. 3.
- Beattie, Vivien and Fearnley, Stella; The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies. 227.
- Breton, Gaétan and Taffler, Richard J.; Creative Accounting and Investment Analyst Response. 81.
- Citron, David B.; The Incidence of Accounting-based Covenants in UK Public Debt Contracts: An Empirical Analysis. 139.
- Coombs, Hugh M. and Edwards, John Richard; The Financial Reporting Practices of British Municipal Corporations 1835–1933: A Study in Accounting Innovation. 93.
- Edwards, Pamela; Segmental Reporting: A Preparers' Perspective. 151.
- Fleischman, Richard K., Hoskin, Keith W. and Macve, Richard H.; The Boulton & Watt Case: The Crux of Alternative Approaches to Accounting History? 162.
- Goodwin, Jenny and Trotman, Ken T.; Audit Judgments of Revalued Non-current Assets: The Effect of Conflicting Risks. 177.
- Gul, Ferdinand A., Tsui, Judy S. L., Fong, Steve C. C. and Kwok, Helen Y. L.; Decentralisation as a Moderating Factor in the Budgetary Participation-Performance Relationship: Some Hong Kong Evidence. 107.
- Hennessey, Sean M.; Earnings Forecast Revisions and Security Returns: Canadian Evidence. 240.
- Herrmann, Don and Thomas, Wayne; Harmonisation of Accounting Measurement Practices in the European Community. 253.
- Jones, Stewart and Love, Kerry; Recent Evidence on Australian Current Value Accounting Practices: Is the Phoenix Rising from the Ashes? 266.
- Jones, Stewart, Romano, Claudio A. and Smyrniotis, Kosmas X.; An Evaluation of the Decision Usefulness of Cash Flow Statements by Australian Reporting Entities. 115.
- Karim, Rifaat Ahmed Abdel; The Nature and Rationale of a Conceptual Framework for Financial Reporting by Islamic Banks. 285.
- Mitchell, Falconer, Reid, Gavin C. and Terry, Nicholas G.; Post Investment Demand for Accounting Information by Venture Capitalists. 186.
- O'Clock, Priscilla and Devine, Kevin; An Investigation of Framing and Firm Size on the Auditor's Going Concern Decision. 197.
- Rees, Lynn L.; The Information Contained in Reconciliations to Earnings Based on US Accounting Principles by Non-US Companies. 301.
- Rouse, Paul; The Recognition of Executory Contracts. 15.
- Tippett, Mark and Whittington, Geoffrey; An Empirical Evaluation of an Induced Theory of Financial Ratios. 208.
- Tyson, Thomas; Collective Bargaining and Cost Accounting: The Case of the US Men's Clothing Industry. 23.
- Wallace, R. S. Olusegun, Naser, Kamal and Mora, Araceli; The Relationship Between the Comprehensiveness of Corporate Annual Reports and Firm Characteristics in Spain. 41.

ARTICLES (by title)

- Audit Judgments of Revalued Non-current Assets: The Effect of Conflicting Risks by Jenny Goodwin and Ken T. Trotman. 177.
- Boulton & Watt Case: The Crux of Alternative Approaches to Accounting History? by Richard K. Fleischman, Keith W. Hoskin and Richard H. Macve. 162.

- Collective Bargaining and Cost Accounting: The Case of the US Men's Clothing Industry *by* Thomas Tyson. 23.
- Creative Accounting and Investment Analyst Response *by* Gaétan Breton and Richard J. Taffler. 81.
- Decentralisation as a Moderating Factor in the Budgetary Participation-Performance Relationship: Some Hong Kong Evidence *by* Ferdinand A. Gul, Judy S. L. Tsui, Steve C. C. Fong and Helen Y. L. Kwok. 107
- Earnings Forecast Revisions and Security Returns: Canadian Evidence *by* Sean M. Hennessey. 240.
- Empirical Evaluation of an Induced Theory of Financial ratios *by* Mark Tippet and Geoffrey Whittington. 208.
- Evaluation of the Decision Usefulness of Cash Flow Statements by Australian Reporting Entities *by* Stewart Jones, Claudio A. Romano and Kosmas X. Smyrniotis. 115.
- Financial Reporting Practices of British Municipal Corporations 1835-1933: A Study in Accounting Innovation *by* Hugh M. Coombs and John Richard Edwards. 93.
- Harmonisation of Accounting Measurement Practices in the European Community *by* Don Herrmann and Wayne Thomas. 253.
- Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies *by* Vivien Beattie and Stella Fearnley. 227.
- Incidence of Accounting-based Covenants in UK Public Debt Contracts: An Empirical Analysis *by* David B. Citron. 139.
- Information Contained in Reconciliations to Earnings Based on US Accounting Principles by Non-US Companies *by* Lynn L. Rees. 301.
- Investigation of Framing and Firm Size on the Auditor's Going Concern Decision *by* Priscilla O'Clock and Kevin Devine. 197.
- Management Aspiration and Audit Opinion: Fixed Asset Accounting at the Staveley Coal & Iron Company 1863-1883 *by* Trevor Baldwin. 3.
- Measurement of Harmonisation and the Comparability of Financial Statement Items: Within-country and Between-country Effects *by* Simon Archer, Pascale Delvaille and Stuart McLeay. 67.
- Nature and Rationale of a Conceptual Framework for Financial Reporting by Islamic Banks *by* Rifaat Ahmed Abdel Karim. 285.
- Post Investment Demand for Accounting Information by Venture Capitalists *by* Falconer Mitchell, Gavin C. Reid and Nicholas G. Terry. 186.
- Recent Evidence on Australian Current Value Accounting Practices: Is the Phoenix Rising from the Ashes? *by* Stewart Jones and Kerry Love. 266.
- Recognition of Executory Contracts *by* Paul Rouse. 15.
- Relationship Between the Comprehensiveness of Corporate Annual Reports and Firm Characteristics in Spain *by* R. S. Olusegun Wallace, Kamal Naser and Araceli Mora. 41.
- Segmental Reporting: A Preparers' Perspective *by* Pamela Edwards. 151.

COMMENTARIES (by author)

- Parker, R. H.; David Solomons and British Accounting. 311.
- Zeff, Stephen A.; David Solomons (1912-1995)—An Appreciation. 315.

COMMENTARIES (by title)

- David Solomons and British Accounting *by* R. H. Parker. 311.
- David Solomons (1912-1995)—An Appreciation *by* Stephen A. Zeff. 315.

BOOKS REVIEWED

- Brimson, James A. and Antos, John; Activity-based Management, reviewed by Mahmoud Ezzamel. 62.
- Bromwich, M. and Bhimani, A.; Management Accounting Pathways to Progress, reviewed by F. Mitchell. 133.
- Brown, Philip; Capital Markets-based Research in Accounting: An Introduction (Coopers & Lybrand Accounting Research Methodology Monograph No. 1), reviewed by Len Skerratt. 131.
- Canadian Institute of Chartered Accountants; Using Ratios and Graphics in Financial Reporting, reviewed by Vivien Beattie. 61.
- Carnegie, G., Cravens, J. and Gibson, R.; Cases in Financial Accounting, reviewed by Stuart Turley. 221.
- Clark, P.; European Financial Reporting Series. Luxembourg, reviewed by R. H. Parker. 131.
- Coltman, M. M.; Hospitality Management Accounting, reviewed by Alan Gregory. 135.

Dijksma, J. and Hoogendoorn, M.; European Financial Reporting Series. The Netherlands, reviewed by R. H. Parker. 131.

Fédération des Experts Comptables Européens; Seventh Directive Options and their Implementation, reviewed by Paul D. Gordon. 57.

Flower, J.; The Regulation of Financial Reporting in the Nordic Countries, reviewed by T. E. Cooke. 219.

Gordon, P. D. and Gray, S. J.; European Financial Reporting Series. United Kingdom, reviewed by R. H. Parker. 131.

Gray, S. J., Coenenberg, A. G. and Gordon, P. D. (eds.); International Group Accounting—Issues in European Harmonisation, reviewed by M.W. Pendlebury. 55.

Hilton, Dudley and Sharp, Isobel; Stock Exchange Reporting, reviewed by Roger Hussey. 60.

Hussey, Roger and Bishop, Mary; Corporate Reports—A Guide for Preparers and Users, reviewed by Paul D. Gordon. 59.

Hussey, Roger and Woolfe, Sarah; Interim Statements and Preliminary Profit Announcements, reviewed by Garry Carnegie. 58.

Lefebvre, Christian and Flower, John; European Financial Reporting Series. Belgium, reviewed by Ann Jorissen. 320.

Marriott, Neil and Chandler, Roy; Management Accounting: A Spreadsheet Approach, reviewed

by Ken Pratt. 134.

Ordelheide, D. and Pfaff, D.; European Financial Reporting Series. Germany, reviewed by R. H. Parker. 131.

Parker, R. H. and Yamey, B. S. (eds.); Accounting History. Some British Contributions, reviewed by Richard P. Brief. 56.

Poneman, Lawrence A. and Gabhart, David R. L.; Ethical Reasoning in Accounting and Auditing, reviewed by Michael Power. 130.

Scheid, J.-C. and Walton, P.; European Financial Reporting Series. France, reviewed by R. H. Parker. 131.

Weetman, P., Collins, W. and Davie, E.; Operating and Financial Review: Views of Analysts and Institutional Investors, reviewed by Judy Day. 58.

York, David; Audit Reports: A Practical Guide to Preparation Under SAS 600, reviewed by E. N. M. Okike. 220.

Zeff, Stephen A. and Dharan, Bala G.; Readings and Notes on Financial Accounting: Issues and Controversies, reviewed by David Pendrill. 136.

EDITORIAL 226.

OCCASIONAL REVIEWERS 223.

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The Cost of Equity Capital and a Generalisation of the Dividend Growth Model

D. J. Ashton*

Abstract—In this paper a generalisation of the dividend growth model is developed. This model relates the growth in dividends to a company's earnings and asset base. The resulting model involves the solution of an eigenvalue system of equations. It is shown how a closed form approximation to this system exists. The econometric procedures that might be used to parameterise the model are considered, and the methodology is illustrated using five UK companies.

Introduction

Interest in methods of estimating the cost of equity capital has been rekindled by its use as a benchmark of profitability in the recently privatised industries. While extensive use is made of the capital asset pricing model (CAPM) for regulatory purposes, several of the regulators have also used the dividend growth model to estimate a fair return to equity (Office of Water Services, 1991). Most text books, and many research studies (Davies and Wadhvani, 1988), imply that the capital asset pricing and the dividend growth models give identical results and that the models can be used interchangeably. Unfortunately, this is far from the truth where future growth¹ is extrapolated from recent dividend histories, as can be seen in Table 1.

This table shows the mean estimates of the five year returns to equity capital derived from the

CAPM and growth models of 359 UK companies with continuous records over the period 1985-1990. The differences in the mean estimates are significant, and for individual companies the differences can be substantial. This is evidenced by the fact that the correlation between these estimates is at best² only 0.33.

While the CAPM tends to find favour among academics and most regulatory bodies as a method of estimating the cost of equity capital, application is not without problems. Recent work by Fama and French (1992) and Kothari, Shanken and Sloan (1995) casts doubt on the ability of the CAPM to provide an adequate model of the return to equity at the level of the individual firm. Even if we prefer to accept the theoretical elegance of the CAPM and to ignore its empirical shortcomings, we are left with problems associated with estimating the parameters of the model. These problems centre on the size of the risk premium (see Scott, 1992) and the methodology appropriate to its estimate (Water Services Association, 1992; Spackman, 1991). Other problems concern the nature of tax adjustments (Ashton, 1989) and the procedures adopted for the estimation of betas. For example, the frequently used estimate produced by the LBS Risk Measurement service uses a Bayesian estimation procedure that weights the 'raw' beta towards unity. The argument here is that the prior beta of any UK equity is one. In the case of regulated industries it is far from clear that this is an appropriate assumption. Notwithstanding these problems, the CAPM has the distinct advantages that it essentially computes a risk pre-

*The author is professor of accounting and finance at the University of Bristol. This paper is part of a project sponsored by the Institute of Chartered Accountants in England and Wales into risk return relationships. He would like to thank the Institute for its support and to acknowledge the helpful comments and contributions of Dr. P. Pope of the University of Monash and A. Merriman at Bristol, who helped in the preparation of the data set. The author would also like to thank Mark Tippet and other delegates at the Capital Markets Conference, Grasmere, May 1995, as well as Ken Peasnell and the two anonymous referees of this paper for their constructive and helpful comments. Correspondence should be addressed to Professor Ashton at the Department of Economics, University of Bristol, 8 Woodland Road, Bristol BS8 1TN.

¹In Table 1, the term dividend growth model (DGM) refers to a model where the growth is estimated on the basis of recent dividend histories. In the case of Table 1, the growth estimate was based on a regression of the log of dividends against time. The term Gordon growth model (GGM) is used to describe models where the estimate of future growth is made by multiplying the fraction of earnings retained by some measure of the return on equity. In our case the equity base was Datastream item 305 excluding the revaluation reserve.

²A similar investigation was carried out in June 1994 based on a sample of the largest 600 companies with continuous dividend payments over the last five years. The correlation between costs of equity based on the dividend growth model and the CAPM was (insignificantly) negative.

Table 1
The Cost of Equity Capital for the 500 largest UK Companies (1985–1990)

	<i>Mean value</i>	<i>Correlation</i>	
		<i>DGM</i>	<i>GGM</i>
Dividend growth model* (DGM)	26.2		
Gordon growth model* (GGM)	19.5	0.27	
Capital asset pricing model** (CAPM)	18.7	0.34	0.13

*The dividend yield was taken at the end of June 1990.

**The after-tax risk-free rate—the July 1990 Treasury Bill Rate—was taken as 9.7% and a risk premium of 9% was used.

mium to be added to (say) the treasury bill rate and that the resulting estimate almost invariably lies in the 'plausible' range³ of 10–20%.

In contrast, an estimation of the cost of equity capital using the dividend growth model (DGM) by, say, merely extrapolating the geometric mean growth over the last five years, as was done in the construction of the estimates in Table 1, can produce some very odd results. The returns were calculated for the period 1985–90. The importance of the choice of period from which growth is to be extrapolated is emphasised when growth rates are estimated over different periods for the same company. This point is illustrated in Table 2. In this table, growth rates are computed using an exponential growth model over different periods for five UK companies. Based on these growth rates, estimates of the cost of equity are made. Where negative earnings prevented the use of an exponential model, the growth rate was estimated as the arithmetic mean. Occasionally, the inter-period growth rates were so erratic as to make the reporting of a mean figure misleading. What is noticeable in this table is the wide range of growth estimates and hence cost of capital of these companies that emerge, depending on the choice of model and the sample period. The five companies in Table 2 will be used to illustrate the algorithms developed in this paper for estimating the cost of equity capital.

One of the problems with making estimates of

the cost of capital based on growth models is that growth models tend to impute a high growth rate, and hence high cost of capital to firms that have recently been successful, and exhibit strong dividend growth. Equally, a low cost of capital is attributed to firms that have experienced recent cuts in dividends. Indeed, for many of the firms in the period 1985–90, dividends were growing faster than earnings and assets. While there may have been some massaging of earnings during this period (Smith, 1992), clearly such a situation cannot persist indefinitely as is assumed in the model. Several attempts have been made to overcome these deficiencies by using a two or even three stage growth model (Copeland and Weston, 1988), where this 'supernormal' growth is assumed to persist for only a short period. Such models are ad hoc in nature and it is not easy to estimate how long the super-growth will last. In this context, the Gordon growth model, where growth is estimated from the rate of return on retentions, at least makes the implicit assumption that dividends, earnings and assets all grow at the same uniform rate.

In this paper a different approach to estimating the growth pattern is adopted; it is based on the theoretical work of Ohlson (1989) into the relationship between share prices and accounting variables, and the subsequent development of the model by Steele (1990). The result is a generalisation of the DGM with a single growth parameter, to a model where the period-on-period growth is specified by three growth parameters. These growth parameters depend on the long-run relationship between dividends, earnings and the equity base. Although the model has three growth parameters, it is very different from a three-stage growth model. In a three-stage growth model, the dividend growth is assumed to be constant over three distinct periods. In our model not only does the growth in each period differ, but also the short-run growth in dividends, earnings and assets may differ from each other in each period. In the long run, the growth of dividends, earnings and

³The emphasis here is on the word plausible rather than correct. The risk premium for a particular stock is computed as the product of the beta and the equity risk premium. The standard error on beta estimates is typically of the order of 0.2. The equity risk premium as measured by the mean of historic returns over 1919–92 is 9% with a standard error of about 2.5%. Indeed there are authors, such as Scott (1992), who argue for a risk premium at the lower end of a 95% confidence interval based on the 9% average and suggest that the risk premium might be as low as 2%. Thus for a stock with a beta of about 1, we might say that the risk premium is in the range 1.2% ($0.6 \times 2\%$) to 20% ($1.4 \times 14\%$). This crude estimate of a confidence interval serves to emphasise the illusory accuracy of costs of equity based on the CAPM.

Table 2
Growth Rates and Cost of Equity Capital (percentage per annum-ending 1992)

	<i>Marks and Spencer</i>		<i>BP</i>		<i>ICI</i>		<i>TI Group</i>		<i>RHM</i>	
	5-year	20-year	5-year	20-year	5-year	20-year	5-year	20-year	5-year	20-year
	Nominal Data									
Dividends/share	8.8	14.8	-3.6	15.6	1.9	10.0	11.9	4.7	6.9	10.8
Earnings/share	7.7	16.0	-19.7	7.3	-21.7	6.3	-1.1	no pattern	-3.2	13.2
Book value assets	8.0	13.0	0.6	7.0	-0.4	4.3	-1.3	-3.5	13.5	1.3
Gordon growth	12.9	9.5	3.6	6.2	6.9	6.6	14.6	6.1	19.7	8.4
	Real growth									
Dividends/share	2.5	6.1	-9.2	6.8	-4.1	1.6	5.4	-3.3	-0.4	2.1
CPP earnings/share	-3.4	5.0	-36.7	-1.1	-38.1	-49.1*	-3.3	1.1*	-16.2	12.0*
CCA earnings/share	1.6	7.6	-27.5	8.9*	-26.8	-71.5*	-2.6	no pattern	-12.1	-2.2*
Gordon growth CPP	4.0	3.0	1.7	3.7	1.7	1.4	2.8	-0.7	5.7	2.2
Gordon growth CCA	3.9	2.4	1.0	1.4	1.8	0.6	3.0	-1.8	6.1	0.3
	Cost of equity (nominal)									
Dividend yield (average 1992)	2.2	-	4.5	-	4.9	-	3.8	-	4.8	-
Dividend growth nominal	11.2	17.4	0.8	20.8	6.9	15.4	16.0	8.5	12.9	17.0
Gordon growth nominal	15.4	11.9	8.2	11.0	12.1	11.8	18.8	10.0	26.4	14.4
CAPM (nominal)**	15.1	-	14.3	-	17.0	-	19.0	-	14.2	-
	Cost of equity (real)									
Dividend growth real	4.7	8.5	-5.1	11.6	0.6	6.6	9.3	0.3	5.2	7.9
Gordon growth-CPP	6.3	5.2	6.3	8.4	6.7	6.4	6.7	3.0	10.8	7.1
Gordon growth-CCA	6.2	4.7	5.5	5.9	6.8	5.5	6.9	1.9	11.2	5.1
CAPM (real**)	9.1	-	8.2	-	10.9	-	13.0	-	8.1	-

*Arithmetic mean
**CAPM estimates are based on a nominal after-tax risk-free rate of 7.1% and after-tax real risk-free rate of 1%.

assets do converge to the same value—a desirable property about which the conventional three-stage growth model says little.

The computation of a cost of equity using the model in this paper involves the solution of a cubic equation followed by the solution of three systems of simultaneous equations. However, one of the principal results in this paper is to show that a fairly simple and robust closed-form approximation to the above system of equations exists. An expression for the cost of equity is presented which depends on the three growth parameters and the current deviation from the long-run growth path.

The paper then illustrates the data collection and econometric procedures that might be used to estimate the parameters in the model using data from the five companies listed in Table 2. This exploration demonstrates both the availability of the data and the relative ease with which appropriate estimates can be made using existing software. The results of 100 estimates confirm the accuracy of the approximating algorithms developed in the paper.

The model

As indicated in the previous section, the method is based on a model by Ohlson that maps out a possible form for the relationship between share prices, earnings, dividends and assets. This model hypothesises that dividends, D_t , earnings, E_t , and assets, A_t , in period t are all related to their values in the previous period by a simple linear relationship, as in equation (1), where the v 's denote random errors. The coefficients in this linear relationship can be conveniently summarised in the Ω -matrix.

$$\begin{aligned} D_t &= w_{11} D_{t-1} + w_{12} E_{t-1} + w_{13} A_{t-1} + v_{1t} \\ E_t &= w_{21} D_{t-1} + w_{22} E_{t-1} + w_{23} A_{t-1} + v_{2t} \\ A_t &= w_{31} D_{t-1} + w_{32} E_{t-1} + w_{33} A_{t-1} + v_{3t} \end{aligned} \quad (1)$$

$$[\Omega] = \begin{pmatrix} w_{11} & w_{12} & w_{13} \\ w_{21} & w_{22} & w_{23} \\ w_{31} & w_{32} & w_{33} \end{pmatrix}$$

$$\mathbf{x}_t = \text{Expected value of } \begin{pmatrix} D_t \\ E_t \\ A_t \end{pmatrix} = [\Omega] \mathbf{x}_{t-1}$$

If we assume that $\mathbf{x}_t$ is a 3×1 column vector whose components are, respectively, the expected value of dividends, earnings and assets at time t and that $\mathbf{e}$ is the row vector $(1,0,0)$ then the ex-div price of

the share at time zero is given by equation (2).

$$P = \sum_{i=1}^{\infty} \frac{\mathbf{e}[\Omega]^i \mathbf{x}_0}{(1+r)^i} \quad (2)$$

where r is the shareholders' required rate of return or cost of equity. In general, the three eigenvectors $\mathbf{z}^{(i)}$ of $[\Omega]$ will be independent and can be used to form a basis. We will assume this to be the case. Hence $\mathbf{x}_0$ can be written as

$$\mathbf{x}_0 = f_1 \mathbf{z}^{(1)} + f_2 \mathbf{z}^{(2)} + f_3 \mathbf{z}^{(3)} = [\mathbf{Z}] \mathbf{f}$$

$$\text{or} \quad \mathbf{f} = [\mathbf{Z}]^{-1} \mathbf{x}_0 \quad (3)$$

where $\mathbf{Z} = [\mathbf{z}^{(1)} \mathbf{z}^{(2)} \mathbf{z}^{(3)}]$ is the 3×3 matrix formed from the eigenvectors and

$$\mathbf{f} = \begin{bmatrix} f_1 \\ f_2 \\ f_3 \end{bmatrix}$$

is a column vector. We shall let $[\Lambda]$ denote a 3×3 matrix with the eigenvalues $\lambda_1, \lambda_2, \lambda_3$ on the leading diagonal and zeroes elsewhere, then the defining property of the eigenvalue-eigenvector relationship can be written $[\Omega][\mathbf{Z}] = [\mathbf{Z}][\Lambda]$

$$\text{This implies that } [\Omega]^i \mathbf{x}_0 = [\Omega]^i [\mathbf{Z}]^{-1} [\mathbf{Z}] \mathbf{f} = [\mathbf{Z}] [\Lambda]^i \mathbf{f} \quad (4)$$

If we make the further assumption that the eigenvectors are normalised such that their first element is unity

$$(\text{i.e. } \mathbf{z}^{(i)} = \begin{bmatrix} 1 \\ z_{i2} \\ z_{i3} \end{bmatrix}).$$

This implies $\mathbf{e} \mathbf{z}^{(i)} = 1$ and that $\mathbf{e} [\mathbf{Z}] [\Lambda]^i \mathbf{f} = \sum f_i \lambda_i^i$

Our pricing equation (2) becomes:

$$P = \sum_{i=1}^{\infty} \sum_{j=1}^3 \frac{f_j \lambda_j^i}{(1+r)^i} \quad (5)$$

A condition for the closed form expression for P to exist is that the absolute size of the largest eigenvalues should be less than the discounting factor of $1+r$. If we make this assumption then we have our fundamental pricing equation in the form

$$P = \sum_{i=1}^3 \frac{f_i \lambda_i}{(1+r-\lambda_i)} = \frac{f_1 \lambda_1}{(1+r-\lambda_1)} + \frac{f_2 \lambda_2}{(1+r-\lambda_2)} + \frac{f_3 \lambda_3}{(1+r-\lambda_3)} \quad (6)$$

This last equation is a (three-dimensional) generalisation, based on the Ohlson model (1989), of the dividend valuation model. The three eigenvalues λ_1 , λ_2 and λ_3 of the Ω -matrix are the three growth parameters that determine the year on year growth of dividends, earnings and assets while the current dividend yield, earnings-price ratio and book to market value of assets determine the values of f_i . In the degenerate case where $\lambda_1 = \lambda_2 = \lambda_3 = \text{constant} = 1+g$, equation (6) reverts to the simple dividend growth model.

In our subsequent analysis, it will prove convenient to work with return data and we will re-define $\mathbf{x}_t$ by dividing D_t , E_t and A_t by the current market price P .

$$\text{Thus } \mathbf{x}_t = \begin{pmatrix} D_t/P \\ E_t/P \\ A_t/P \end{pmatrix} = \begin{pmatrix} d_t \\ e_t \\ a_t \end{pmatrix}$$

$$\text{and } \mathbf{x}_0 = \begin{pmatrix} d_0 \\ e_0 \\ a_0 \end{pmatrix} = f_1 \begin{pmatrix} 1 \\ z_1^{(1)} \\ z_2^{(1)} \end{pmatrix} + f_2 \begin{pmatrix} 1 \\ z_1^{(2)} \\ z_2^{(2)} \end{pmatrix} + f_3 \begin{pmatrix} 1 \\ z_1^{(3)} \\ z_2^{(3)} \end{pmatrix} \quad (7)$$

where coefficients f_i are determined by the initial dividend yield, price earnings ratio and book to market value.

Our pricing equation, equation (6), thus becomes the following return equation, equation (8), relating the cost of equity capital r to the eigenvalues.

$$1 = \sum_i \frac{f_i \lambda_i}{(1+r-\lambda_i)^t} \quad (8)$$

Although the structure of equation (8) is relatively simple, the identification of the cost of capital r would at first sight seem to be a somewhat daunting prospect. First, appropriate econometric procedures must be adopted to estimate the $[\Omega]$ matrix. We must then identify the eigenvalues of the $[\Omega]$ matrix, which involves the solution of a cubic equation followed by the solution of 3 (3×3) simultaneous equations to estimate the individual eigenvectors. This enables the values of f_i to be computed from equation (3). Finally the computation of the cost of equity capital from equation (8) again involves the solution of a cubic equation. Although, in theory, closed form solutions for the cost of equity, the eigenvalues and eigenvectors all exist, in practice such a solution is so grotesquely cumbersome as not to be useful. Another obvious approach is to use numerical methods. The functional dependency on r , given that we have identified the eigenvalues and eigenbasis, is well-behaved and differentiable, lending itself to solution by the Newton-Raphson procedure (Wolfram, 1991).

While the solution of eigenvector systems can be accomplished within many econometric packages, in the end neither of these approaches was used. Both rely to some extent on the brute force number crunching power of the computer that obscures any intuition behind a solution to equation (8). It will be shown in the next section how a closed form solution to the above system exists such that the model can easily be seen as a generalisation of one-dimensional growth models. In order to do it is useful to consider a simpler (two-dimensional) formulation of the problem.

A two-dimensional model

We can examine in detail the way the model works by integrating the Gordon growth model, where the growth is estimated from the fraction of earnings retained with Lintner's dividend policy model (Lintner, 1956). In one variant of the Lintner model, it is assumed that expected dividends adjust as a speed α to the target dividend according to

$$\Delta D_t = D_t - D_{t-1} = \alpha(D^* - D_{t-1})$$

where it is assumed that D^* is computed from a target payment γ based on expected earnings in t according to

$$D^*_t = \gamma E_t$$

We also assume that the firm earns a constant rate of return on opening assets according to

$$E_t = k A_{t-1}$$

The equation, combined with the clean surplus equation, gives rise to the following system of equations, from which an additive error has been omitted for the sake of clarity.

$$D_t = (1-\alpha)D_{t-1} + (1-b)k A_{t-1}$$

$$A_t = -(1-\alpha)D_{t-1} + (1-bk)k A_{t-1} \quad (9)$$

where the product $\alpha\gamma$ has been replaced by $1-b$.

The eigenvalues of the 2×2 matrix representing the above growth process are the roots of the quadratic

$$\lambda^2 - \lambda[(1-\alpha) + (1+bk)] + (1-\alpha)(1-k) = 0$$

which has a solution

$$\lambda = 1 + \frac{bk-\alpha}{2} \pm \frac{1}{2} \sqrt{(bk-\alpha)^2 - 4k(1-b-\alpha)} \quad (10)$$

It should be noted that in the case where $\alpha = 1$, when the dividends adjust instantaneously to earnings, the model reduces to the Gordon growth model, with a growth factor given by $1+bk$. If the

speed of adjustment is less than unity then we need to solve the following return equation, which is a two-dimensional (quadratic) version of equation (8)

$$1 = \frac{f_1 \lambda_1}{1+r-\lambda_1} + \frac{f_2 \lambda_2}{1+r-\lambda_2} \quad (11)$$

where f_1 and f_2 are given by the solution to

$$\begin{pmatrix} d_0 \\ a_0 \end{pmatrix} = \begin{pmatrix} \frac{D_0}{P} \\ \frac{A_0}{P} \end{pmatrix} = f_1 \begin{pmatrix} 1 \\ z_{12} \end{pmatrix} + f_2 \begin{pmatrix} 1 \\ z_{22} \end{pmatrix} \quad (12)$$

On multiplying out our return equation, equation (11), we get the following expression for $1+r$

$$(1+r)^2 - (1+r)(\lambda_1 + \lambda_2) + \lambda_1 \lambda_2 = (1+r)(\lambda_1 f_1 + \lambda_2 f_2) - \lambda_1 \lambda_2 (f_1 + f_2) \quad (13)$$

Equation (13) involves f_1 and f_2 . We can avoid finding explicit expressions for f_1 and f_2 by observing that

$$d_0 = f_1 + f_2$$

and
$$d_1 = \frac{D_1}{P} = f_1 \lambda_1 + f_2 \lambda_2$$

This enables us to write down the solution to equation (13) in the form

$$1+r = \frac{\lambda_1 + \lambda_2 + d_1}{2} \pm \frac{\frac{1}{2} \sqrt{(\lambda_1 + \lambda_2 + d_1)^2 - 4\lambda_1 \lambda_2 (1+d_0)}}{2} \\ = \frac{\lambda_1 + \lambda_2 + d_1}{2} \pm \frac{\frac{1}{2} \left[(\lambda_1 - \lambda_2)^2 + 2d_1(\lambda_1 + \lambda_2) - 4\lambda_1 \lambda_2 d_1 + d_1^2 \right]^{\frac{1}{2}}}{2} \quad (14)$$

Now since, as we shall see $d_1, d_0 \ll \lambda_1 - \lambda_2$, where λ_1 is assumed to be the larger eigenvalue, we can use the binomial theorem to expand the expression in the square bracket, ignoring terms of order d^2 , to arrive at the approximation as in equation (15).

$$1+r = \lambda_1 \left[1 + d_0 + \frac{d_1 - \lambda_1 d_0}{\lambda_1 - \lambda_2} \right] \quad (15)$$

This equation has an obvious intuitive interpretation. Asymptotically the growth path must correspond to that determined by the dominant (larger) eigenvalue. Thus the term $\lambda_1 (1+d_0)$ is just the usual expression for return $1+r$ derived from a growth model. To this term is added a correction term

determined by the extent to which the forecast dividend at time 1 and the current dividend, scaled up by the long-run growth rate, differ. This correction represents the extent of the current deviation from the long-run growth path. If $d_1 = \lambda_1 d_0$ and the firm is on the long-run growth path the correction⁴ disappears. The 'dividend yield' d_1 can be calculated by multiplying the current dividend yield and book/market value by the Ω -matrix:

$$\begin{pmatrix} d_1 \\ a_1 \end{pmatrix} = \begin{pmatrix} \frac{D_1}{P} \\ \frac{A_1}{P} \end{pmatrix} = \Omega \begin{pmatrix} \frac{D_0}{P} \\ \frac{A_0}{P} \end{pmatrix} \quad (16)$$

This analysis illustrates the features of the more complex model. The model integrates estimates of growth based on the return to equity with the relationship between dividends, earnings and the equity base. In the following section, this idea is explored in a more general model with fewer restrictions on the relationship between dividends, earnings and assets.

A linear approximation to the full model

The full model involves the specification of a 3×3 matrix, the eigenvalues of which are the solution of a cubic equation and the eigenvectors involve the solution of 3 (3×3) simultaneous equations. We can avoid some of these computations and still generate a linear approximation similar to that in the previous section by using perturbation theory. As we shall demonstrate, this approximation has negligible error for all practical purposes. For convenience we shall again assume that the three eigenvalues⁵ of the full system are all real and distinct and ordered such that $\lambda_1 > \lambda_2 > \lambda_3$. Then if we multiply out our (three-dimensional) return equation (8) we get

$$(1+r)^3 - (1+r)^2(\lambda_1 + \lambda_2 + \lambda_3 + f_1 \lambda_1 + f_2 \lambda_2 + f_3 \lambda_3) \\ + (1+r)(\lambda_1 \lambda_2 + \lambda_1 \lambda_3 + \lambda_2 \lambda_1 + \lambda_2 \lambda_3 + \lambda_3 \lambda_1 + f_1 \lambda_1 \lambda_2 + f_1 \lambda_1 \lambda_3 + f_2 \lambda_2 \lambda_1 + f_2 \lambda_2 \lambda_3 + f_3 \lambda_3 \lambda_1 + f_3 \lambda_3 \lambda_2) - \lambda_1 \lambda_2 \lambda_3 \\ (1+f_1+f_2+f_3) = 0$$

A direct solution to this cubic equation would involve an expression for r in terms of both the eigenvalues and the individual values of f_i . Again we can avoid the computational burden of finding the

⁴The solution assumes that λ_1 and λ_2 are real and distinct. If λ_1 and λ_2 are complex conjugates denoted by λ, λ^* then the (real) return is approximated simply by $|\lambda| (1+d_0)$.

⁵We will assume that we have numerically identified the eigenvalues. This is a relatively trivial procedure and can be performed within most econometric packages by a single request.

individual values of f_i by observing that

$$d_0 = \frac{D_0}{P} = f_1 + f_2 + f_3$$

and since $\mathbf{x}_1 = \Omega \mathbf{x}_0 = f_1 \lambda_1 \mathbf{z}^{(1)} + f_2 \lambda_2 \mathbf{z}^{(2)} + f_3 \lambda_3 \mathbf{z}^{(3)}$

it follows that $d_1 = \frac{D_1}{P} = f_1 \lambda_1 + f_2 \lambda_2 + f_3 \lambda_3$

$$\text{and } d_2 = \frac{D_2}{P} = f_1 \lambda_1^2 + f_2 \lambda_2^2 + f_3 \lambda_3^2 \quad (17)$$

By rearranging these last two equations for d_1 and d_2 , we can establish that

$$(\lambda_1 + \lambda_2 + \lambda_3)d_1 - d_2 = f_1 (\lambda_1 \lambda_2 + \lambda_1 \lambda_3) + f_2 (\lambda_2 \lambda_1 + \lambda_2 \lambda_3) + f_3 (\lambda_3 \lambda_1 + \lambda_3 \lambda_2)$$

This enables us to rewrite our cubic equation for r in the form

$$(1+r)^3 - (1+r)^2 [\lambda_1 + \lambda_2 + \lambda_3 + d_1] + (1+r) [(\lambda_1 \lambda_2 + \lambda_1 \lambda_3 + \lambda_2 \lambda_3) + (\lambda_1 + \lambda_2 + \lambda_3)d_1 - d_2] - \lambda_1 \lambda_2 \lambda_3 [1 + d_0] = 0 \quad (18)$$

Asymptotically the largest eigenvalue will dominate, and we might expect a solution for $1+r$ of the form $\lambda_1(1+d_0)$. We will assume that a better approximation is given by a 'perturbation' of the form $\lambda_1(1+d_0+\epsilon)$ where ϵ is of the same order of magnitude as d_0 , d_1 , and d_2 and that we can ignore cross products and all other non-linear terms in ϵ , d_0 , d_1 , and d_2 . Substituting $\lambda_1(1+d_0+\epsilon)$ for $1+r$ into the equation and ignoring all non-linear terms in ϵ , d_0 , d_1 and d_2 , we can solve equation (18) for ϵ .

This generates our approximation for the cost of equity capital in the form:

$$1+r = \lambda_1 \left\{ 1 + d_0 + \frac{(\lambda_2 + \lambda_3 - \lambda_1) \lambda_1 d_0 - (\lambda_2 + \lambda_3) d_1 + d_2}{(\lambda_1 - \lambda_2)(\lambda_2 - \lambda_3)} \right\} \quad (19)$$

This last equation is a closed-form generalisation⁶, based on the Ohlson model (1989), of the simple dividend growth model for calculating the cost of equity capital model. We might note that on the long-run growth path $\lambda_1^2 d_0 = \lambda_1 d_1 = d_2$ and $1+r$ is just $\lambda_1(1+d_0)$ as we might expect. The terms involving d_1 and d_2 thus pick up the deviation from the long-run growth path.

As subsequent simulations showed, although such deviations may persist for several years, the correction term is sufficiently accurate that this deviation may be fully captured. Identifying the ei-

genvalues $\lambda_1, \lambda_2, \lambda_3$ of a 3×3 matrix is a facility offered by most econometric packages, and the value of expression (19) can be computed within the programming facilities offered by such packages. The econometric packages used were SHAZAM for the preliminary exploration of the data and LIMDEP (1992) for the estimation of the parameters and cost of equity capital.

Data

Although the previous section develops a relatively simple formula for the cost of equity capital in terms of the eigenvalue of the $[\Omega]$ matrix, it leaves unanswered the question of how one might estimate the eigenvalues in the case of particular companies. In order to illustrate this point, dividend, earnings and book value of equity over the period 1973–1992 for the five companies in this study were extracted from the Datastream Company Accounts Service in per-share form, adjusted to allow for the effects of capitalisation issues. From the nominal reported dividends per share as shown in the accounts (Datastream item 187), a second dividend series was created by adjusting this series to end-1992 purchasing power terms using the retail price index (RPI).

The earnings series used in the investigation of nominal returns was the earnings per share as measured by Datastream (account item 182). This differs from the amount shown in the annual accounts, since Datastream adjusts it for certain exceptional items. In order to arrive at an inflation-adjusted figure, as in current purchasing power (SSAP 7) terms, plausible, but of necessity fairly arbitrary, assumptions were made about asset lives and the timing of sales and purchases, as well as changes in long-term debt. A further earnings series, approximating earnings per share as in current cost accounting (SSAP 16), was generated, employing the same set of assumptions about asset lives and the timing of sales and purchases but using specific price indices for the relevant industries. These last two series were then adjusted to end-1992 purchasing power terms by the use of the RPI.

The base series used to measure assets, or rather corporate equity, was Datastream account item 305 (ordinary capital and reserves). This figure was then adjusted for inter-firm comparability by subtracting any revaluation reserves or capitalised purchased intangibles. The inflation-adjusted asset figures were generated from the inflation-adjusted dividend and earnings figures by adding cumulative retentions, adjusted for extraordinary items, to an estimate of the 1972 asset base. Because of lack of suitable data, the initial (1972) asset figure for equity was taken as the mean equity market value over the period 1970–1975. The above procedures produced the four data sets shown in Tables 3 and

⁶Perturbation theory could have been applied to the previous section to give the derived approximation.

4, each consisting of three series with different measures of dividends, earnings and assets over the 19 years between 1973–1992 for each of five companies.

Econometric problems

In theory, we could estimate the elements of the Ω matrix directly from past data by econometric procedures appropriate to such a system of equations.⁷ In practice, such an approach ignores the financial theory underlying the recursive relationship and would involve the identification of all nine elements of the Ω matrix. The estimation of such a large number of elements from comparatively few data points is likely to result in unreliable estimates.

It is possible to identify those coefficients that we can fairly confidently hypothesise to be zero and the implicit relationship between others. For example, Lintner's (1956) and Fama and Babiak's (1968) empirical investigations of dividend policy suggest that the current level of dividends D_t is related to the last year's dividend D_{t-1} and the change in earnings $E_t - E_{t-1}$ that has occurred as in equation (11)

$$D_t = \theta_1 D_{t-1} + \theta_2 (E_t - E_{t-1}) + u_{1t} \quad (20)$$

Here u_{1t} denotes a random error term in the estimating equation.

For the earnings equation, we hypothesise a persistence of earnings together with a dependency on the opening value of assets A_{t-1} and that current earnings are independent⁸ of last year's dividend, as in equation (21).

$$E_t = \theta_3 E_{t-1} + \theta_4 A_{t-1} + u_{2t} \quad (21)$$

The equation for assets at time t was derived using the accounting identity that the change in assets, adjusted for new issues, is equal to the retained earnings as in equation (22):

$$A_t = A_{t-1} + E_t - D_t + u_{3t} \quad (22)$$

While this obviates the need to estimate any further parameters, it is not without its problems. First, the equation ignores any reserve accounting that takes place. Some of these issues such as the impact of revaluations were explicitly modelled. Thus, in the modelling of the earnings equation, measures of assets were used that included and excluded revaluations. While the figures were on a

per share basis with the number of shares in issue adjusted for capitalisation and new issues, the method of adjustment makes a number of simplifying assumptions. For example, historical comparability would only strictly be maintained if the issue price of new shares were equal to the current book value per share. The alternative of treating new equity as a negative dividend flow would have caused a different set of problems.

The adjustments to the reserves were regarded as a random error term to be added to equation (22). While this is not a particularly satisfactory assumption, the alternative of a detailed modelling of reserve accounting policy seemed too daunting a task. As we shall see, all substantial differences that occurred between the estimates of the cost of equity capital based on the different models tested could be attributed to 'reserve accounting' and the assumption that the clean surplus equation holds for such companies.⁹

In summary, we hypothesise that the system of equations as represented by equations (20), (21) and (22) can be parameterised by just five coefficients $\theta_1, \theta_2, \theta_3, \theta_4, \theta_5$ with the dividend and earnings relationship defined by

$$\begin{aligned} D_t &= \theta_1 D_{t-1} + \theta_2 E_{t-1} + \theta_3 A_{t-1} \\ E_t &= \theta_4 E_{t-1} + \theta_5 A_{t-1} \end{aligned} \quad (23)$$

The remaining coefficients in our Ω matrix can be derived from the clean surplus equation.

$$A_t = -\theta_1 D_{t-1} + (\theta_4 - \theta_2) E_{t-1} + (1 + \theta_5 - \theta_3) A_{t-1} \quad (24)$$

with

$$\Omega = \begin{pmatrix} \theta_1 & \theta_2 & \theta_3 \\ 0 & \theta_4 & \theta_5 \\ -\theta_1 & \theta_4 - \theta_2 & 1 + \theta_5 - \theta_3 \end{pmatrix} \quad (25)$$

Preliminary investigations

Although the θ_4 -coefficients reported in the results were estimated as a system of equations using Zellner's technique (Zellner, 1962), prior to this, the dividend and earnings model were explored separately as defined by equations (20) and (21).

⁷The Ohlson system of equations (equation (1)) is an autoregressive, as opposed to simultaneous, system. As such it can be estimated by the method of seemingly unrelated regressions (Greene, 1990, p. 552).

⁸This assumes that last year's dividend carries no information about future earnings. Thus our empirical investigations, though not our theoretical model, exclude the effects of signalling.

⁹A second series was formed by adjusting the reported earnings per share figure for extraordinary and exceptional gains and losses as an approximation to FRS 3 profit. The use of this measure of 'comprehensive' income was also explored in this phase of the investigation, but it weakened the dependency of earnings on the previous years' earnings, as well as removed the dependency on the asset base. Perhaps not surprisingly it also weakened the statistical relationship with dividends. As a result this measure was abandoned.

This enabled a whole battery of tests not normally available for systems of equations to be used. This included tests for heteroscedasticity and autocorrelation. Potentially, the presence of autocorrelation is likely to produce most problems in models with lagged dependent variables since it may produce biased estimates of the coefficients.

The Durbin's h-test (Maddala, 1988) and the lagrange multiplier test of Godfrey (1978) were used to test for serial correlation. The results of tests indicated that for some of the companies there was evidence of serial correlation. None of the models estimated showed serial correlation significant at a 10% level when historical data were used. However, two of the data sets exhibited serial correlation when using the inflation-adjusted data. This was probably attributable to the way such data were generated. There was a strong exception to this rule where an attempt was made to relate earnings to the lagged value of assets only, as in the case of the two-dimensional model. Almost without exception, the model displayed a highly significant degree of autocorrelation, frequently of the order of 0.8 or greater. This suggests strongly the existence of a unit root and the omission of the lagged dependency on earnings. This hypothesis was confirmed when a comparison was made with models that contained earnings as a lagged independent variable in the earnings model. In this case not only was the autocorrelation reduced but it usually became statistically insignificant. The results of this model (model 4) are still reported in Tables 3 and 4 in order to gain an understanding of the likely impact of problem misspecification.

Tests for heteroscedasticity were carried out by testing the relationship between the square of the residual error on the estimated value of the dependent variable. The Breusch and Pagan test and those due to Glejser (Maddala, 1988) were also used. Such evidence as there was of heteroscedasticity was mainly confined to the historical data set. Moreover, the heteroscedasticity tended to disappear when the model was adjusted for autocorrelation. This suggests that the tests for heteroscedasticity were probably picking up the dependency between the error term and the lagged independent variables. As a result of these preliminary investigations, all the estimates reported in the tables were after adjustments for autocorrelation, since this would appear to be potentially the greatest source of bias. The precise nature of these adjustments are reported in the next section.

Finally, a brief investigation of the order of the autoregressive structure was carried out. The lagged cross-dependency (i.e. the relation, say, between dividends and earnings and assets) in these

single equation models was generally quite weak.¹⁰ There was some evidence that the lagged structure of say dividends per share on itself was more than order 1, though the evidence varied between companies. There was no evidence of higher order structures for the cross-dependency. Of course, it would be very difficult to come to any definite conclusions from such a small sample size about the order of the system. Neither are these issues central to the work reported in this paper, the purpose of which is to develop and explore an alternative procedure to computing the cost of equity capital based on Ohlson's work.

Econometric procedures

In all, four models were used to estimate the five θ parameters in the Ω -matrix of equation (25). Each of these models was tested against four data sets for each of the five companies, generating a total of 100 estimates of eigenvalue systems. The data sets contained historic cost data, with the equity base including and excluding revaluation reserves. The other two data sets were the CPP and CCA inflation-adjusted data as described earlier in the paper. All the econometric procedures involved variants on the Cochrane-Orcutt method to adjust for autocorrelation and were based on the GLS algorithm of Zellner for the estimation of equation systems using the method of seemingly unrelated regressions.

In model 1, equation system (23) was used to determine the value of θ_i , $i = 1, 5$. The clean surplus equation was then used to derive equation (24). The GLS algorithm used to adjust for autocorrelation in equation systems provided by LIMDEP was in part based on an estimation of the autocorrelation by the Durbin-Watson statistic. In the presence of lagged independent variables, this produces a biased estimate of the autocorrelation and possibly some bias in the final estimate of the parameters. In model 2, a procedure proposed by Hatanaka (1974) to cope with autocorrelation bias in models with lagged dependent variables was programmed into the estimation algorithm. Apart from this difference in estimation procedures, models 1 and 2 were identical. As can be seen by a comparison of results from model 1 and 2 in Tables 3 and 4, this elaboration appeared not to make a significant difference.

In model 3, the clean surplus equation was used to eliminate D_{t-1} and E_{t-1} from equation system (23) to produce a revised 2×3 system was

$$\begin{aligned} D_t &= \theta'_1 A_{t-2} + \theta'_2 E_{t-1} + \theta'_3 A_{t-1} \\ E_t &= \theta'_4 Z_{t-1} + \theta'_5 A_{t-1} \end{aligned} \quad (26)$$

¹⁰The statistical significance of the parameters was improved when the parameters were estimated as a system of equations.

where $\theta_1 = \theta'_1$, $\theta_2 = \theta'_2 - \theta'_1$, $\theta_3 = \theta'_3 - \theta'_1$, $\theta'_4 = -\theta'_4$, $\theta'_5 = \theta'_5 - \theta'_4$ and with a new variable defined by $Z_{t-1} = D_{t-1} + A_{t-2}$. Model 4 is a straightforward application of the two-dimensional model and took the form

$$\begin{aligned} D_t &= \theta_1 D_{t-1} + \theta_2 A_{t-1} + u_{1t} \\ A_t &= -\theta_1 D_{t-1} + \theta_3 A_{t-1} + u_{2t} \end{aligned} \quad (27)$$

In all of these models an error structure of the form $u_{it} = \rho_i u_{it-1} + \epsilon_{it}$ was assumed, with ϵ_{it} denoting white noise.

Results

We shall start by reviewing the results of individual companies, since this will help with drawing more general conclusions from the methodology. The results are summarised in Tables 3 and 4.

Marks and Spencer was chosen because it provides a data set that is relatively well-behaved. Dividends, earnings and assets all grow at roughly the same rate. Extraordinary items reported are relatively small and there is comparatively little reserve accounting. Marks and Spencer served as a test that the basic algorithms were working and were capable of producing sensible results. Perhaps not surprisingly, but to the relief of the author, the parameter estimates for the company were plausible and stable. For this company the estimates of the nominal and real cost of equity were also consistent in that they differed by roughly the rate of average rate of inflation (8.1%) over the 20-year period. In contrast, all the remaining companies exhibited erratic growth rates as between dividend, earnings and assets or over time. Most of them made extensive use of extraordinary items or revaluations of assets.

For example, the dividend and earnings history of British Petroleum is much more erratic than that of Marks and Spencer and is perhaps more typical of many UK companies. It experienced rapid growth in dividends and earnings in the late 1970s and early 1980s. More recently, its earnings have declined and it cut its dividend in 1992. In the case of the company, the long-run growth in dividends per share had exceeded both its growth in assets and its growth in earnings per share. It is the largest of the three eigenvalues that provides an estimate of the long-run growth in dividends. The nominal long-run growth rate is 5.6%, based on historic cost data, and the real long-run growth rate is 2.9% based on CPP data.

Figure 1 shows the five-year moving average growth rate for dividends, earnings and assets, together with the predicted inter-period growth rate over the next 9 years for this company, based on historical data. Although BP did make a further cut in dividends in 1993, as forecast by the model, these predictions of future dividend growth must

not be taken too literally. The method in this paper merely extrapolates the long-run average relationship between dividends, earnings and assets. This relationship is assumed to be invariant over time. Of more importance is the ability of the model to make any sense of the data. Clearly the generally accepted approach of merely adding the dividend yield to a five-year average growth rate at any particular point in time over the last 15 years would have resulted in widely fluctuating estimates of the cost of equity capital.

What is also worth noting is the accuracy of the numerical approximation to the long-run cost of equity, even though the growth path takes several years to converge to its long-run equilibrium. The approximation (equation (19)) gives a cost of equity capital of 10.02%. This compares with the 'correct' value given by a solution to the pricing equation, equation (8) of 10.013%. Similar computations on other data sets confirm that the accuracy of the approximation to be such that typically the error was no more than about 0.1%. Thus any discrepancy greater than this between models and data sets for the same company cannot be attributed to the approximating algorithm.

The results from models 1 and 2 are virtually indistinguishable, and for many of the companies model 3 gave very similar results to models 1 and 2. However, substantial discrepancies between the estimates of the cost of capital occur between models 1 and 2 and those generated by model 3 in the case of RHM, and to a lesser extent in the case of the TI Group. This discrepancy is most stark in the case where the measure of the asset base used is the nominal value of the owner's equity, excluding any revaluation reserves or the effects of intangible assets. For both these companies there was a substantial difference between growth rates in dividends and in assets on a per share basis. In this respect the inclusion of intangibles or surpluses on property revaluation in the asset base increases the consistency of estimates between models 1 and 2. The discrepancy is attributable to substantial differences between reported earnings and a 'comprehensive' measure of earnings. Models 1 and 2 use reported earnings as an independent variable and assume a clean surplus equation holds, and no reserve accounting takes place. In model 3, the substitution effectively redefines earnings in terms of change in assets. Model 4 ignores the earnings dependency. Growth is determined by the joint growth paths of earnings and assets and thus the results tend to track, albeit imperfectly, the results of model 3.

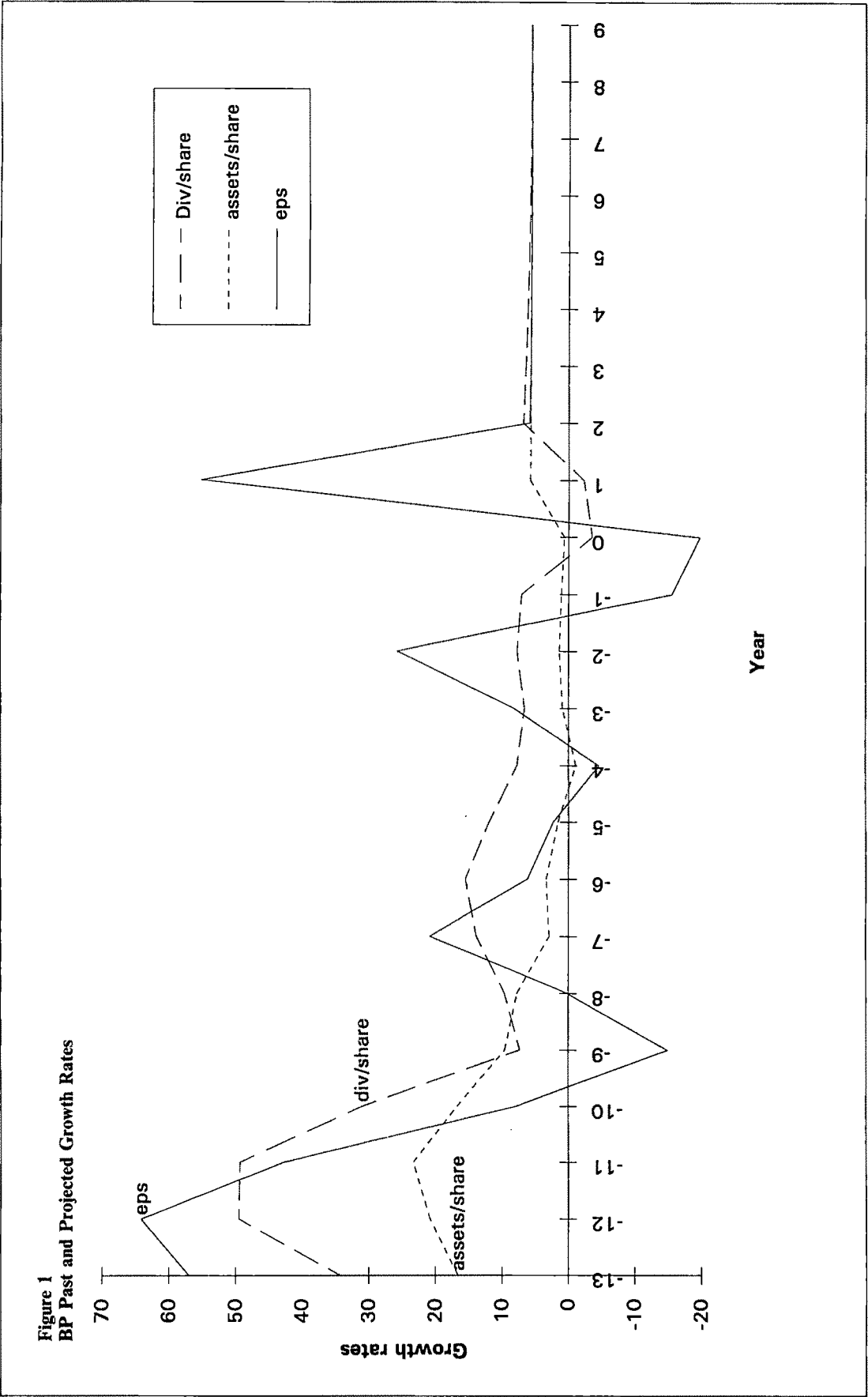
Occasionally, a different set of problems arose with model 4. For instance, the model gives a relatively high estimate of the cost of equity capital for ICI using historical data. The largest eigenvalue is complex, implying a sinusoidal growth path. ICI's growth path based on model 4 was

Table 3
Rates of return (nominal data)

		Marks and Spencer		BP		ICI		TI-Group		RHM	
		Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)
Equity less revaluation reserve	Model 1	15.2 (12.4)	0.99 (0.99)	10.2 (5.6)	0.89 (0.81)	5.8 (3.3)	0.96 (0.68)	1.8 (0.9)	0.89 (0.66)	13.2 (8.6)	0.97 (0.93)
	Model 2	15.1 (12.2)	0.99 (0.99)	10.2 (5.6)	0.86 (0.13)	6.4 (3.7)	0.96 (0.48)	0.9 (1.7)	0.8 (0.53)	13.6 (9.1)	0.99 (0.85)
	Model 3	14.5 (11.2)	0.98 (0.97)	10.1 (5.2)	0.84 (0.22)	7.5 (4.2)	0.88 (0.6)	5.1 (3.9)	0.75 (0.62)	5.0 (3.2)	0.96 (0.88)
	Model 4	14.3 (11.0)	0.99 (0.93)	10.1 (5.5)	0.87 (0.33)	6.1 (3.5)	0.96 (0.62)	6.8 (6.7)	0.89 (0.64)	6.7 (1.6)	0.95 (0.85)
Total equity	Model 1	12.8 (10.4)	0.99 (0.98)	9.7 (4.8)	0.90 (0.79)	5.9 (3.2)	0.96 (0.68)	5.4 (1.6)	0.88 (0.66)	10.9 (6.4)	0.64 (0.92)
	Model 2	12.8 (9.5)	0.99 (0.98)	9.7 (4.9)	9.86 (0.77)	6.5 (3.7)	0.97 (0.49)	5.9 (2)	0.81 (0.53)	10.5 (6.1)	0.64 (0.81)
	Model 3	11.9 (10.4)	0.99 (0.97)	9.4 (4.8)	0.87 (0.88)	7.6 (4.3)	0.96 (0.66)	7.7 (3.2)	0.75 (0.62)	7.5 (3.1)	0.97 (0.78)
	Model 4	11.7 (9.2)	0.99 (0.97)	9.6 (4.4)	0.88 (0.35)	11.3 (3.4)	0.96 (0.62)	4.2 (0.3)	0.16 (0.64)	7.8 (3.2)	0.9 (0.63)

Table 4
Rates of return (inflation adjusted data)

		Marks and Spencer		BP		ICI		TI - Group		RHM	
		Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)	Return (growth)	R - Sqd DIV (R - Sqd EPS)
CCA	Model 1	7.7 (4.7)	0.96 (0.93)	8.1 (0.9)	0.79 (0.11)	5.2 (0.2)	0.62 (0.55)	0.4 (-2.5)	0.6 (0.34)	7.2 (0.7)	0.89 (0.89)
	Model 2	7.7 (4.7)	0.89 (0.93)	8.5 (1.4)	0.79 (0.75)	5.1 (0.1)	0.69 (0.56)	1.8 (-1.7)	0.58 (0.32)	9.2 (3.7)	0.85 (0.8)
	Model 3	7.0 (3.7)	0.96 (0.92)	8.5 (1.5)	0.69 (0.42)	4.8 (-0.1)	0.73 (0.65)	0.8 (-2.4)	0.62 (0.37)	1.2 (6.6)	0.78 (0.62)
	Model 4	6.5 (3.9)	0.97 (0.93)	7.9 (0.6)	0.81 (0.16)	5.9 (0.1)	0.58 (0.67)	1.2 (-1.9)	0.75 (0.55)	-5.0 (0.1)	0.86 (0.87)
CPP	Model 1	7.6 (4.7)	0.96 (0.93)	9.7 (2.9)	0.67 (0.69)	6.1 (1.1)	0.47 (0.37)	1.1 (-0.9)	0.81 (0.69)	6.5 (2.1)	0.85 (0.56)
	Model 2	7.6 (4.7)	0.89 (0.93)	9.9 (2.8)	0.46 (0.68)	5.9 (1.3)	0.57 (0.28)	2.5 (-0.1)	0.66 (0.43)	6.4 (2.1)	0.75 (0.27)
	Model 3	7.0 (3.7)	0.96 (0.92)	9.9 (2.8)	0.61 (-0.15)	5.7 (0.8)	0.58 (0.32)	2.5 (-0.1)	0.71 (0.61)	6.6 (2.2)	0.82 (0.62)
	Model 4	6.5 (3.8)	0.97 (0.93)	9.8 (2.9)	0.21 (-0.05)	6.9 (1.7)	0.62 (0.36)	3.2 (0.2)	0.84 (0.6)	7.4 (2.9)	0.86 (0.55)



computed over a 200-year period on an Excel spreadsheet using the Ω -matrix to generate the dividend, earnings and asset path. It was found that for substantial portions of the simulated time, dividends exceeded earnings, thereby generating negative assets. This problem only occurred in the cases of complex eigenvalues in this study. The only other instances of complex eigenvalues arose with RHM, using historical data.

In summary, in the case of historical data, the method of seemingly unrelated regressions resulted in a reasonable fit of the data, as is evidenced by the relatively high R-squared values. However, for most of the companies in the study the estimated cost of capital seems on the low side. The fit using data adjusted for inflation resulted in a slightly poorer fit¹¹ as measured by the size of R^2 . Clearly, it is the reported earnings figure that is a key determinant in managements' dividend decision. For much of the period, inflation-adjusted figures were neither reported nor presumably calculated. Adjusting the dividends, earnings and assets for inflation tended to produce internally consistent estimates, with, if anything, the CPP estimates being more stable between models than the CCA estimates. This internal consistency is to some extent forced on the model by the use of the clean surplus equation to generate the inflation adjusted asset base. More significantly, the CPP estimates of the cost of capital were not only plausible but fell between the five-year and 20-year estimates based on real dividend growth.

Conclusion

The theory presented in this paper is an attempt to refine the simple one-parameter dividend growth models. In particular, the current model is aimed at relating the dividend growth to the growth in earnings and in assets. While it suffers the same criticism as the one parameter dividend growth model of being merely an extrapolation of past data, it is able to distinguish between those dividend growth paths that are consistent and those that are inconsistent with the predicted path of earnings and assets. It also represents a more rigorous approach to the estimation of non-constant growth than is afforded by two and three-stage growth models.

The application of the algorithm to real data is illustrated using just five major UK companies. In reviewing the results it should also be remembered that four of the companies were deliberately chosen because they were likely to present difficulties

in parameterising the model. The problems encountered would appear to stem largely from measuring (or more correctly reporting) problems in the data set. While dividends and earnings are fairly closely related, it was not always easy to relate the firm's earnings-generating potential to the equity portion of the asset base. This is perhaps not surprising in view of the amount of reserve accounting that took place in these companies. While in all the cases considered in this paper, assets grew at a slower rate than earnings, it is not clear that asset growth is a better proxy for long-run growth (Smith, 1992). In our case, the relatively slow growth in the historical value of shareholders' equity certainly reduced our estimated return to equity. Of course, shifts in the level of gearing were also ignored, though this is the normal assumption that is made in empirical studies of the cost of capital.

While the estimation procedures used here are considerably more refined than those typically used in growth models, where econometric issues are largely ignored, they remain vulnerable to the danger of mis-specification of the dynamic process. Higher order lags were not explored, not least of all because the aim of the research was to parameterise and exploit the Ohlson model. The principal difficulties stem from the assumptions that are made about the data set. The assumption inherent within our model is that the data set of earnings and assets are such that the clean surplus equation holds. Clearly, with much of the historical data used in this paper, such an assumption is not always true even in some stochastic sense. The consistency of the results between models using inflation-adjusted data is attributable to the fact that this assumption holds by construction. Nonetheless, despite these shortcomings, the results make some sense of what is a very difficult data set, in which estimates of the growth based on only some single measure such as dividends, earnings or assets are fraught with potential disaster.

It should also be emphasised that the computation of a cost of equity for the five companies is secondary to the main aim of the paper. Its principal aim is to show how recent research into security pricing can be used to extend the dividend growth model in a simple yet consistent way to deal with the earnings and equity growth paths. The purpose of the data analysis was merely to explore the problems of estimating the parameters and to provide a test of the approximation procedure. In this context the linear approximation works extremely well. The algorithm is easily 'programmable' within the code provided by many econometric packages and the computational burden is not excessive.

Clearly, while problems remain with the use of historical data, which no amount of refining of

¹¹In this study the absolute level rather than the difference was used as an independent variable. This tends to increase the reported R^2 , though not to bias the parameter estimates. This is acceptable for our purposes, since the R^2 was not used to discriminate between models.

econometric procedures will overcome, the use of CPP inflation-adjusted data might seem a reasonable way forward. It is simpler to use on a large scale than CCA data, and on the admittedly limited evidence in this paper would not appear to produce inferior results.

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Contemporary Accounting Research/Recherche Comptable Contemporaine

Table of Contents

Fall 1994 Volume 11, No. 1-II

Gerald Salmon and Thomas Stober

Cross-quarter Differences in Stock Price Response to Earnings Announcements: Fourth-quarter and Seasonality Influences

Sung S. Kwon and John Wild

Informativeness of Annual Reports for Firms in Financial Distress

Somnath Das and Baruch Lev

Nonlinearity in the Returns-Earnings Relation: Tests of Alternative Specifications and Explanations

Nasser Spear

The Stock Market Reaction to the Quantity Disclosures of U.S. Oil and Gas Producers

D. Eric Hirst

Auditor Sensitivity to Earnings Management

Peter Clarkson, Jennifer Kao and Gordon Richardson

The Voluntary Inclusion of Forecasts in the MD&A Section of Annual Reports

Wendy Rotenberg

Discussion of "The Voluntary Inclusion of Forecasts in the MD&A Section of Annual Reports"

Edward Swanson and Noel Addy

Were Lobbyists on Income Tax Accounting Influenced by Income Strategies

Steven Salterio

Researching for Accounting Precedents: Learning, Efficiency and Effectiveness

Jean Bédard

Discussion of "Researching for Accounting Precedents: Learning, Efficiency and Effectiveness"

Nahum Melumad, Mark Wolfson and Amir Ziv

Should Taxpayers be Subsidized to Hire Third-Party Preparers? A Game-Theoretic Analysis

Haim Falk

International Accounting—A Quest for Research

Improvements and Updates

John Hughes and Jennifer Kao

Disclosure Rules and R&D Spending Revisited

Frank Gigler, John Hughes and Judy Rayburn

International Accounting Standards for Line of Business Reporting and Oligopoly Competition

Book Reviews

Charles M. C. Lee

Interim Financial Reporting: A Continuous Process

Daniel Coulombe

Accounting for Options: No Longer an Option

Examining Investment Information Sources for Sophisticated Investors Using Cluster Analysis

David Bence, Kevin Hapeshi, Roger Hussey*

Abstract—In order to contribute to studies of sophisticated users of financial information, cluster analysis is applied to assess the degree of similarity in the use of information sources between and within two groups of sophisticated users. Interviews were conducted with 21 individuals working as investment analysts for stockbrokers and 12 individuals working for institutional investors. All interviews were based on one company operating in an industrial sector that was of prime interest to the interviewees. The study confirms the general conclusions of previous research on the respective sources of information, but demonstrates significant differences between investment analysts and institutional investors. The use of cluster analysis also reveals the deficiencies of concentrating on a hierarchy of information sources, and demonstrates that users employ a limited range of sources but use these in different clusters or groups. Investment analysts tend to use short-term information that is routinely received, whereas institutional investors actively seek information of a less short-term nature.

Introduction

Previous studies have examined the question of the importance of different sources of financial information for forecasts and investment planning. These studies assessed users' needs for, their interest in, and their opinions of, financial statements and other sources of information. Studies of what may be termed the financially sophisticated investor have included institutional investors (Anderson, 1981), financial analysts (Lee and Tweedie, 1981; Arnold and Moizer, 1984; Day, 1986) and bank loan officers (Maksy, 1984). Other studies have attempted to identify the opinions of various user groups (Benjamin and Stanga, 1977; McNally, Eng and Hasseldine, 1982) and some were conducted on an international basis (Chang and Most, 1975). The majority of these studies have captured users' perceptions in general and, as observed by Day (1986) in her study of investment analysts, probably give a less real-life approach because the respondents may have lacked the background knowledge of the industry which is an essential part of financial analysis.

The results of the previous research have normally produced a ranked list of information sources based on overall mean scores of perceived

importance. The majority have used a postal questionnaire with wide variations in response rates. However, Day (1986) used interviews applying protocol analysis, while Gniewosz (1990) conducted research within a single organisation based on both observation and interviews.

This paper reports a study designed to focus on sophisticated users with an interest in a particular company and with knowledge of the relevant industry: the chemical and pharmaceutical sector. The aim of this study was threefold: first, to ascertain whether different clusters of sources of financial information are used by different groups of sophisticated users. Second, to examine a specificity of relationships that would provide a fuller understanding of the financial reporting process. Third, to develop a construct of information sources by using statistical techniques not applied in previous studies of this topic.

Interviews were conducted with 21 investment analysts and 12 institutional investors from different organisations to establish the sources of information they used in making investment decisions in relation to that company. The findings from the interviews produced a ranked list of information sources in line with previous research, but the analysis was extended by using the technique of cluster analysis to establish relationships between sources of information. This analysis demonstrates that the grouping and use of information sources by sophisticated users is related to the duration of their investment objectives.

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Literature review and theoretical framework

Previous studies have mainly required respondents to assess the utility of sources of information based on generalised perceptions; in other words, respondents have been asked to evaluate items of disclosure unrelated to any one particular company. For example, Arnold and Moizer (1984) studied the behaviour of investment analysts using six unstructured interviews and 202 questionnaire responses from UK equity analysts. Because previous studies have not requested that respondents address their comments in the context of a specific company, it is uncertain whether individual responses are comparable. It is quite likely that subjects responded with particular companies or classes of companies in mind. Since it would be reasonable to assume that respondents may give different opinions when asked to compare one company with another, eliciting such 'non-specific' responses may provide unreliable data, a conclusion Day (1986) reached from her study.

A ranking of information sources was produced by Arnold and Moizer, which the authors compared to a similar study by Lee and Tweedie (1981). This confirmed the importance of the profit and loss account and balance sheet as sources of information, but also revealed the importance of direct discussions between the analysts and the company management, thus highlighting the potential influence of continuing relationships in the financial reporting process. The context of the relationship that may already exist between the preparer and recipient of the financial information, and how it might affect the credibility and importance of the information, is incorporated in the design of the present study.

In a further study, Moizer and Arnold (1984) categorised investment analysts either as portfolio managers or as information intermediaries. 'Portfolio managers' are those investment analysts who themselves use the information gathered from their own appraisal of equity shares in the management of portfolios. 'Information intermediaries' are those investment analysts whose equity share appraisal information is used by third parties but not by the analysts themselves. The research showed that portfolio managers analysed companies in less depth than information intermediaries, and spent less of their working week analysing company shares. Information intermediaries made greater use of sources of information such as interviews, interim reports and so on. The only source of information of more importance for portfolio managers was information from other analysts.

Moizer and Arnold (1984) identified several reasons for these differences based on the different contexts and objectives utilised by each group.

Four of those identified are relevant here. First, intermediaries tend to specialise in one area of the market, whereas portfolio holders cover the whole market. Second, portfolio managers spend time actually buying and selling shares, whereas intermediaries do not trade. Third, portfolio managers have to liaise with the owners of the portfolios, whereas intermediaries do not usually deal with shareholders directly. Fourth, intermediaries sell themselves on their knowledge relating to one market sector; their clients are the portfolio managers who do not have this level of specific knowledge.

In this paper, institutional investors have similar features to portfolio managers. The prime purpose of their employing organisations was fund management, and individual responsibilities were channelled in that direction. Investment analysts in the research were all employed by brokers and their responsibilities were advisory to external parties to the organisation. Thus they can be regarded as information intermediaries. Possible differences in the use of information sources by these groups are examined.

Moizer and Arnold (1984) did not focus on the information sources relating to one company, so excluded the contextual relationship between the information provider and the recipient, and the influence of the latter's specialised knowledge base and experiences on information usage. Additionally, they did not investigate whether there were any clear patterns or groupings emerging in the use of information sources, and how this might affect the users' decision strategy. Their approach emphasises the discrete nature of financial information sources. However, it is likely that these sources are overlapping and dependent in nature, representing a smaller number of underlying factors useful to sophisticated users. If so, these should be apparent following the application of certain multivariate classification procedures. The approach taken here is to assess the degree of 'similarity' between various sources of financial information by the use of the technique of cluster analysis (Everitt and Dunn, 1991).

A further aspect of the utility of information sources, which has been largely ignored in previous studies, is the distinction between information that is actively sought and that which is passively received. Connolly (1977) classified information sources used for decision-making by individuals into the following three categories:

1. Information passively received without any specific effort by the recipient and as part of their regular reading and monitoring of professional and non-professional publications.
2. Information sought in response to a specific decision that has to be made.

Table 1
Sources of Financial Information

Annual report and accounts
Personal interviews with and at the invitation of senior managers
Company literature in the form of press releases and product information
Preliminary profit announcements
Organised visits to company premises
Company presentations on the preliminary and interim results and other ad hoc presentations
Telephone conversations with company managers at the instigation of the analyst or institutional investor
Company public relations department
Trade journals
Industry and government statistics
Other analysts
Interim statements
Datastream online database

3. Information that has been previously acquired and stored.

Connolly argues that information acquired by active search will be more decision-specific than information passively acquired and, for the purposes of this study, the distinction between actively sought and passively acquired information forms an important aspect of the analysis.

Method

The Organisation

The organisation is a fully-listed company and within the top 20 largest companies in the UK by market capitalisation. The company is strong financially and at the time of the research had good liquidity, growing profits and dividends. No creative or debatable accounting policies could be identified by the researchers, with the exception perhaps of a highly prudent depreciation policy.

The company was one of the earliest to adopt Financial Reporting Standard 1, *Cash Flow Statements*, and it is keen to be seen as progressive in financial reporting practices.

The Interviewees

The organisation provided the researchers with the names of 25 analysts known to have a specific interest in the shares and industrial sector. Of the analysts approached for interviews four declined to participate. The remainder were interviewed, and their backgrounds are given in the Appendices.

The names of 13 institutional investors with a significant interest in the company were also provided to the researchers, and 12 of these were interviewed. The institutional investors were less of a homogenous group than the analysts because some interviewees were portfolio managers, others

were advisers to fund managers and so on. However, the individuals had the characteristics of 'portfolio managers', as identified by Moizer and Arnold (1984), with investment decisions normally being made by an investing committee. Some institutions had recently invested significant sums in the company, and investments appeared to have been made for the medium to long term. The institutional investors' backgrounds are shown in the Appendices.

Procedure

For both groups the interviewing procedure was identical. A letter was sent to each individual explaining the purpose of the research and a follow-up telephone call was made to arrange an interview. All interviews were conducted at the interviewee's workplace at a mutually convenient time. The interviews were structured around an interview schedule with the main foci being sources of information and the content of the annual report, but most of our questions were open-ended and interviewees were encouraged to raise other matters they considered relevant or of interest. The interviews took on average one and a half hours to complete and were conducted by two researchers, with the early interviews being conducted jointly to ensure consistency.

All interviewees were asked to examine a list of possible sources of information (see Table 1), ranking the importance of the sources for decision making on a scale of 1 to 5, where 1 is most important and 5 is not important. The sources were derived from previous studies with additions relating to the specific disclosure policies of the company concerned. Scale point responses were given orally and subjects were encouraged to give reasons for their choice.

P 6226

Results/discussion

With respect to sources of information, the responses from each subject on the five-point scale were recorded, and overall mean responses calculated for both investment analysts and institutional investors. These are shown in Table 2.

Spearman's correlation coefficient was calculated on the data in Table 2 to establish whether there is a degree of agreement between investment analysts and institutional investors in terms of the order of importance. It was found that there was a significant positive correlation between the ratings of each group for each information source ($Rho=0.643$, $N=13$, $p<0.02$). Therefore, there is general agreement between the two groups on the importance of each source of information, and this confirms the findings of the earlier study by Moizer and Arnold (1984). However, there are some interesting differences. A paired t-test showed that, overall, all of these sources were ranked higher by analysts than by institutional investors ($t=2.79$, $df=12$, $p<0.02$ two-tailed).

This finding that investment analysts perceive the importance of information sources more acutely than other groups was also found in a study by Weetman, Collins and Davie (1994), who commented: 'It became apparent from the interviews that the eagerness for obtaining and disseminating news was much more urgent in the case of brokers' analysts than in the case of inhouse research departments' (p 25). Although the finding of Weetman et al. (1994) was based on only a total of nine interviews, it does reflect the difference between the approach due to organisational goals

rather than individual roles within an organisation.

In the above rankings, two sources were rated more important by the investors than by the analysts. These were Visits to the Company (2.00 vs 2.33) and Other Analysts (2.91 vs 3.57). Both of these sources require an active search approach and, in the following cluster analysis, these issues are explored further to demonstrate that institutional investors adopt a different strategy from investment analysts in constructing their data-set for decision making.

Cluster Analysis

The relative differences between analysts and investors are examined further using a cluster analysis performed on the SPSS for WINDOWS statistical package. The method used was Squared Euclidean Distance, which is the default for this package. This technique enables a classification to be established where different sources are selected to comprise a specific data-set. The results of the cluster analysis on 'cases' (subjects) showed that, with the exception of two individuals, investment analysts and institutional investors formed two very distinctive clusters or groups. In addition, the cluster for institutional investors showed greater unity (smaller distances) between individuals than did the cluster for analysts. This clearly supports the initial impression that the different groups use different strategies and that the analyst group was less homogeneous than the institutional investor group.

A closer examination of the ranked data also

Table 2
Mean Importance Ranking of Financial Information Sources

<i>Sources of information</i>	<i>Rank</i>		
	<i>Investment Analysts</i>	<i>Institutional investors</i>	<i>Combined</i>
Preliminary profit announcements	1.27 (1)	2.50 (5)	1.89 (4)
Personal interviews	1.48 (2=)	1.67 (1=)	1.58 (1)
Interim statements	1.48 (2=)	2.90 (7)	2.19 (6)
Company presentations	1.57 (4)	1.92 (3)	1.75 (3)
Annual report and accounts	1.62 (5)	1.67 (1=)	1.65 (2)
Telephone conversations	2.10 (6)	2.67 (6)	2.39 (7)
Company PR department	2.29 (7)	3.33 (10=)	2.81 (8)
Visits to company	2.33 (8)	2.00 (4)	2.17 (5)
Trade journals	2.38 (9)	3.83 (13)	3.11 (9)
Company literature	2.62 (10)	3.41 (12)	3.02 (11)
Datastream	2.81 (11)	3.17 (9)	2.99 (10)
Industry and government stats	3.19 (12)	3.33 (10=)	3.26 (13)
Other analysts	3.57 (13)	2.91 (8)	3.24 (12)

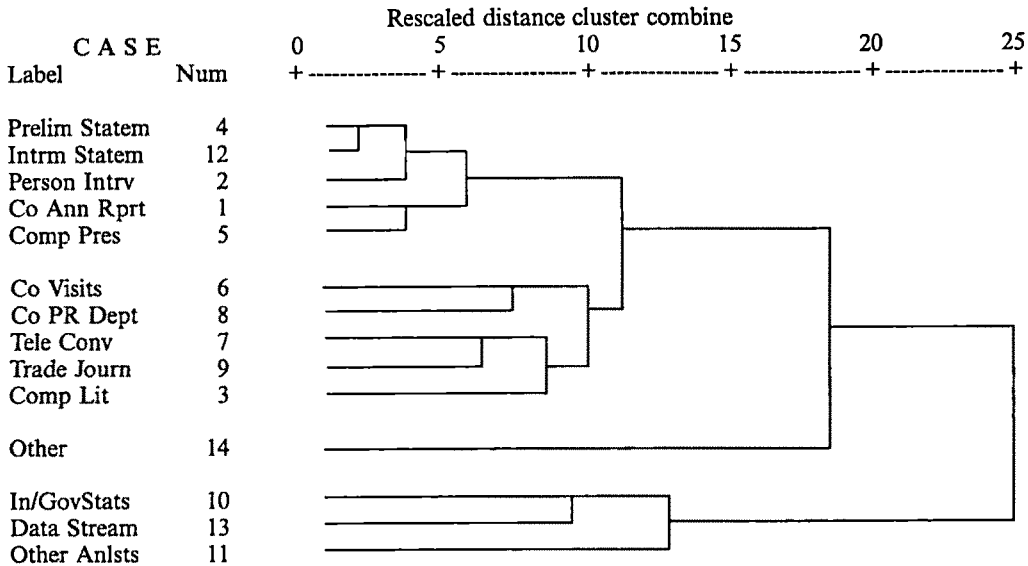
Figure 1

Dendrogram following a cluster analysis on sources of information assessed for importance by 21 investment analysts. Distances between items are rescaled by SPSS to give a score between 0 and 25 (low scores indicate high proximity). These distances are indicated by vertical lines in the dendrogram

*** HIERARCHICAL CLUSTER ANALYSIS ***

Squared Euclidean measure used.

Dendrogram using average linkage (between groups)



shows some fairly large differences between the two groups on some individual items. For example, analysts regarded both preliminary profit announcements and interim statements as extremely important, while investors saw these as only moderately important. Both these sources of information may be regarded as having a higher quality of timeliness rather than completeness, and may be regarded as more useful for short-term decision-making. The factors contributing to these differences between analysts and institutional investors are discussed later in this paper.

Further exploration using cluster analysis provides a means for assessing the degree to which different sources of information can be grouped together. This enables a relatively crude classification, to facilitate the formulation of hypotheses based on the work of Connolly (1977). He argued that information acquired by active search would be more decision-specific than information acquired passively, and that the ease of acquiring information, or converting it into usable form, would affect the extent to which it was used.

Gniewosz (1990), following Connolly, classified information used by analysts into two separate categories. There is the routinely received information, i.e., annual reports, interim reports and fi-

nancial press reports, and there is the directly sought information which originates from steps taken by individual analysts, such as a call made to the company or a visit.

Investment Analysts

The squared Euclidean Distance Method was used in a cluster analysis and the results are summarised in the form of a dendrogram shown in Figure 1.

Only one cluster with an average rank of 2.8 emerges as a clear unified group (in terms of similarity scores). This corresponds to the five highest rated sources of information from the point of view of analysts. These are preliminary statements, interim statements, personal interviews, company annual report and company presentations. From this group, three of the five sources are information which would be classified by Gniewosz (1990) as being routinely received and therefore not decision-specific. In addition, preliminary statements and interim statements are incomplete data-sets in comparison to the annual report, and may be deemed to be most relevant to short-term appraisal. This grouping of information enables a fundamental analysis to be conducted for invest-

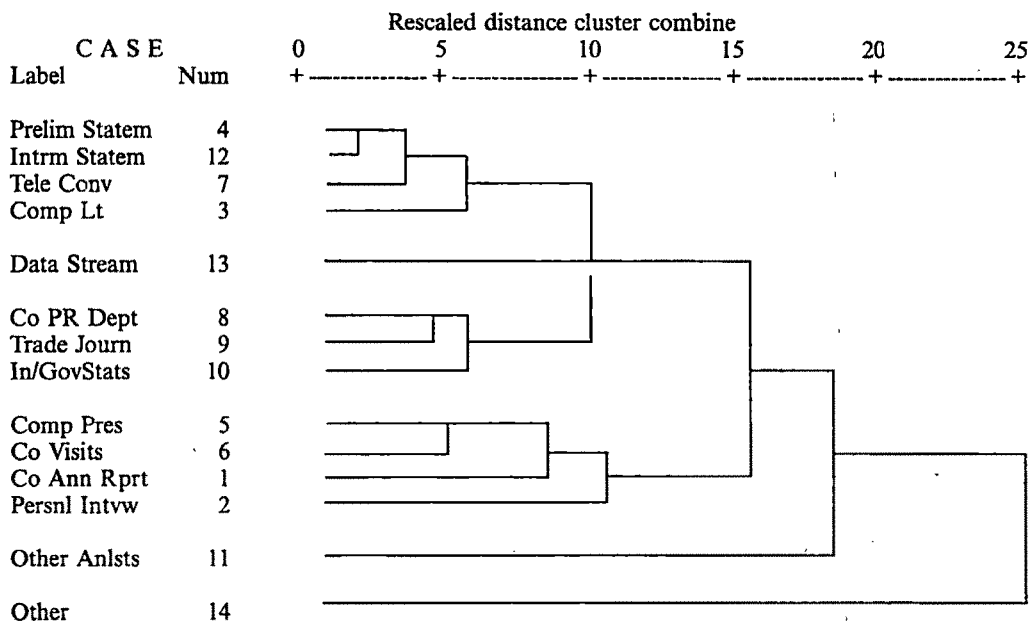
Figure 2

Dendrogram following a cluster analysis on sources of information assessed for importance by 12 institutional investors. Distances between items are rescaled by SPSS to give a score between 0 and 25 (low scores indicate high proximity). These distances are indicated by vertical lines in the dendrogram

* H I E R A R C H I C A L C L U S T E R A N A L Y S I S *

Squared Euclidean measure used.

Dendrogram using average linkage (between groups)



ment appraisal, which Arnold and Moizer (1984) discovered was the primary analysis technique employed. It also demonstrates that decision makers tend to use specific groupings of information and that 'Decisions are never based solely on the information contained in the annual report' (Weetman, Collins and Davie, 1994, p.37).

The second cluster of information sources with an average 'usefulness' rank of 8 suggests that to some extent analysts are seeking more decision-specific information. Although the information in some instances would be routinely received, it is of a general nature. Analysts would, therefore, have to conduct a search and filtering activity in order to retrieve decision-specific information.

The third cluster with an average rank of 12 represents information sources of a very general nature, where analysts would need to conduct an active search process to extract information specific to the company concerned.

Institutional Investors

For institutional investors (as for analysts) the squared Euclidean Distance Method was again used in a cluster analysis, and the results are sum-

marised in the form of a dendrogram shown in Figure 2.

One cluster with an average rank of 2.25 corresponds to the four highest-rated sources of information from the point of view of institutional investors. These are company visits, personal interviews, company annual report and company presentations. What is noticeable is the absence of the two short-term sources of information, the preliminary and interim statements, compared to the sources used by the analysts. In addition, three of these sources of information would be deemed directly-sought information by Gniewosz, which suggests that institutional investors have a much narrower focus of interest compared to analysts and are willing to conduct search activities to obtain the necessary information.

The second cluster with an average rank of 7.5 is the preliminary and interim statements, telephone conversations and company literature. Three of the four sources are mainly routinely received information and do not receive the same degree of interest from institutional investors compared to analysts.

A third cluster, with an average rank of 11, is

the company public relations department, trade journals, and industry and government statistics. Clearly, these sources are regarded as similar and of little value to institutional investors. This provides some evidence that institutional investors are more likely to take a broader long-term view and are less dependent on particular sources of information.

The position of Datastream in the dendrogram requires explanation. The resolution of the graphics in SPSS means that Datastream is not precisely designated, but it has a slightly higher correlation with the first cluster, which contains preliminary statements as the first item, than with the second cluster, with company public relations department as the first item. This is designated by the broken line. These two clusters, together with Datastream, then combine with the cluster containing company presentations as the first item.

Conclusions

Previous research into the importance of information sources to sophisticated users has resulted in a hierarchy of information sources. The current research has improved on this approach by concentrating on the information sources related to one company and the users interested in that company as recommended by Day (1986). Although confirming the general conclusions drawn by other researchers as to the respective importance of sources of information, the current study has demonstrated significant differences between investment analysts and institutional investors, and adopted a different statistical approach in analysing the data.

Although we have referred to the individual sources of information, the cluster analysis and the

interviews demonstrated that it may be misleading merely to rank the information in a hierarchy of importance. It is more accurate to consider a number of information sources as being complementary and forming a cluster. As such the 'information from different sources at times performs different specific functions as well as taking on different levels of significance over the year' (Gniewosz, 1990, p. 226).

The study demonstrates that a model of a ranking of information sources, although helpful in obtaining a general view of the relative importance, obscures the way that the information sources are employed by the user. The application of the technique of cluster analysis has revealed that the users employ a limited range of information sources. For analysts, the main cluster would appear to be that which can be classified as routinely received information, with the emphasis on short-term information. This type of information would serve adequately to conduct the fundamental analysis employed by most investment analysts. With institutional investors, the predominant cluster encompasses information sources where the user takes steps to obtain the information and it is of less of a short-term nature. This reflects the differing objectives of the two groups.

This study was conducted with one company in a particular industry, and there is considerable merit in adopting similar methodology for companies in other industries and with different groups of users. This may allow both the academic and the practitioner to move away from the view of discrete information sources and towards the realisation that there are clusters of information sources, and that these are inherent in a relationship formed within the financial reporting process.

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Appendix 1

Employment Record of Interviewees

	<i>Investment analysts</i>		<i>Institutional investors</i>	
	<i>Years as an analyst</i>	<i>Years specialising in sector</i>	<i>Years as an institutional investor</i>	<i>Years specialising in sector</i>
1-5 years	7	7	1	1
6-10 years	7	9	4	3
11-15 years	1	—	3	4
16-20 years	4	3	3	4
Over 20 years	2	2	1	—

Appendix 2

Educational Background of Interviewees

<i>Qualification</i>	<i>Analysts Number</i>	<i>Institutional investors Number</i>
PhD	4	—
Degree in scientific discipline	10	2
Degree/professional qualification in economics/business studies/accounting	4	9
Not given or relevant	3	1

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Contents

An Examination of Debt-Equity Proxies vs. Actual Debt Covenant Restrictions in Accounting Choice Studies

by JOANNE C. DUKE, DAVID P. FRANZ AND HERBERT G. HUNT III

A Comparative Analysis of the Characteristics of International Takeovers

by LOUIS T.W. CHENG AND KAM C. CHAN

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by W. SCOTT BAUMAN, SUDIP DATTA AND MAI E. ISKANDAR-DATTA

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Table of Contents

Volume 19, Number 2/3

March/May 1995

Editorial Data

Ray Ball and Glenn M. MacDonald

Editorial, Organizations, Incentives and Innovation

Paul Milgrom and John Roberts

Complementarities and Fit: Strategy, Structure, and Organizational Change in Manufacturing

Thomas Hemmer

On the Interrelation between Production Technology, Job Design and Incentives

Michael Gibbs

Incentive Compensation in a Corporate Hierarchy

Robert W. Holthausen, David F. Larcker and Richard G. Sloan

Business Unit Innovation and the Structure of Executive Compensation

Bente Villadsen

Communication and Delegation in Collusive Agencies

Dan Elnathan and Oliver Kim

The Partner Selection and the Group Formation in Cooperative Benchmarking

Laura B. Cardinal and Tim C. Opler

Corporate Diversification and Innovative Efficiency: An Empirical Study

Jennifer Francis and Abbie J. Smith

Agency Costs and Innovation: Some Empirical Evidence

Anne Beatty, Philip G. Berger and Joseph Magliolo

Motives for Forming Research & Development Financing Organizations

Sanjai Bhagat and Ivo Welch

Corporate Research & Development Investments: International Comparisons

Advertisements

Accounting Reforms in China: Cultural Constraints on Implementation and Development

Lynne Min-ying Chow, Gerald Kun-kwai Chau and Sidney J. Gray*

Abstract—There is considerable theory and evidence to suggest that culture is an important environmental variable influencing the development of accounting systems internationally. According to the Hofstede (1980) and Gray (1988) cultural models, China's accounting development and practice should be in the cluster that supports statutory control, uniform practices, a conservative measurement approach and secrecy in disclosure. A uniform and rigid system of financial reporting has been practised for decades in the People's Republic of China under the centrally controlled economy. The accounting reforms launched since the 1980s aim to establish a new framework for regulating financial reporting which is adaptable to China's recently emerged socialist market economy. The adoption of accounting standards in the later phases of the reforms marks a dramatic turning point in China's accounting history towards a more international Anglo-Saxon orientation in financial reporting. Based on an analysis of the authority for accounting systems, the accounting profession and accounting measurement and disclosure in China, it is argued that this development will be constrained by the influence of China's culture and its accounting sub-culture. While financial reporting will be governed by accounting standards, their development and enforcement will remain a governmental and legalistic function. Accountants will continue to rely heavily on detailed technical rules. This mixed orientation will constitute China's unique national identity in terms of its accounting and financial reporting system.

Introduction

In comparative studies of accounting principles and practices, researchers have become increasingly aware of the importance of environmental factors in shaping a country's accounting system. In its long history, accounting has responded continually to the environment in which it functions (Mueller, 1967; Zeff, 1972). Culture is often considered to be one of the crucial environmental variables in this respect (Gray, 1988). An understanding of cultural relativism is, therefore, important in the evaluation of diverse accounting systems and those undergoing changes (Secord and Su, 1994).

A number of research studies have explored the effect of cultural variables on accounting development. A general approach is to identify a set of specific societal values or cultural factors likely to be directly associated with accounting practices. Two often cited studies are Hofstede's (1980) and Gray's (1988) models. In an attempt to develop a commonly acceptable terminology to describe cultures, Hofstede identified four distinct societal

value dimensions which he considered to be reflective of a country's cultural orientation or 'collective mental programming'. These dimensions were identified as: individualism versus collectivism, large versus small power distance, strong versus weak uncertainty avoidance, and masculinity versus femininity.

Hofstede (1991) subsequently included an additional dimension based on Chinese values relating to a long-term versus short-term orientation. Gray's study represents an attempt to apply Hofstede's model to accounting by identifying the mechanism whereby societal values are associated with the accounting sub-culture which directly influences accounting practices. The four accounting values identified by Gray as being related to societal values are: professionalism versus statutory control; uniformity versus flexibility; conservatism versus optimism; and secrecy versus transparency. He suggested that 'a methodological framework incorporating culture may be used to explain and predict international differences in accounting systems and patterns of accounting development internationally' (Gray, 1988, p. 5).

Other studies of this cultural dimension include the work by Jaggi (1975) and Harrison and Mckinnon (1986). Jaggi examined the impact of the cultural environment and the background of managers on the reliability and extent of financial

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disclosure. He advanced the argument that culture was a factor shaping accounting and disclosure practices. In the study by Harrison and McKinnon (1986), a methodological framework incorporating cultural influences was proposed for analysing changes in corporate reporting regulation and accounting policy formulation in the Japanese context. Bloom and Naciri (1989) analysed the cultural impact on accounting standards-setting by undertaking a comparative study of the US, Canada, England, West Germany, Australia, New Zealand, Sweden, Japan and Switzerland. They hypothesised that the standard-setting process was a function of a country's culture and tradition. In Perera's study (1989), he tended to identify certain cultural aspects which he believed to have direct association with accounting practices. He asserted that 'cross-cultural, behavioural research in accounting is likely to provide some explanation as to why differences in accounting techniques and practices exist between countries'.

Secord and Su (1994), in an attempt to test for the correspondence between national culture and accounting practice in Asia, treated national culture as a separate environmental factor with distinct effects on accounting systems and business practices. In examining the cultural relevance of western accounting systems to developing countries, Baydoun and Willett (1995) argued that the major significance of the concepts of cultural values and cultural relevance was likely to be in terms of their effect on practices that have more to do with accounting disclosure than accounting measurement.

There is considerable theory and evidence, therefore, to suggest that culture is an important factor influencing the development of accounting systems internationally. In the People's Republic of China, the accounting reforms launched since the 1980s have gone through several evolutionary phases, resulting in a structural change in the regulatory framework of financial reporting. The task of the reforms is to establish a new framework for regulating financial reporting that is adaptable to China's unique socialist market economy, while maintaining harmonisation with international practices to the extent possible.

The purpose of this paper is to analyse issues encountered in these reforms from a cultural perspective. Specifically, the paper addresses the question concerning the extent to which Chinese culture is likely to constrain the implementation of the reforms in practice. First, the long-standing accounting systems in China are examined and the process and impact of the accounting reforms are outlined. Issues and prospects relating to the reforms are then discussed and evaluated in the context of China's cultural environment. This discussion is based not only on published reports but on in-depth interviews with mainland China account-

ing academics, practising accountants and government officials involved in various phases of the reforms. The paper concludes with a commentary on the unique national characteristics of accounting and financial reporting in China.

China's traditional accounting system

Fund-oriented Accounting Practice

Since the establishment of the People's Republic in 1949, China has implemented a public-ownership economy. State enterprises were either directly managed by the central government through national ministries or by local governments. The means of production were owned by the state and allocated to enterprises in accordance with national plans. Profits enterprises made were remitted to the state as part of national revenue. Under such a centrally planned economy, the primary objective of accounting was directed towards accountability and stewardship, consistent with the information needs for the national economic plans (Winkle et al., 1994). Accounting practices have been developed on the concept of 'fund'. 'Fund applications' and 'fund sources' are the two basic accounting elements; the former refers to employment and utilisation of funds in acquiring property, goods and materials for production while the latter represents the channel for obtaining and generating funds.

State enterprises obtain funds mainly from state appropriations and bank loans. Since the early 1980s, enterprises have been allowed to retain a portion of excessive profit on fulfilment of targets contracted with governments. Funds accumulated through retained profits, i.e. enterprise fund, has since constituted an important source of funds. Fund sources are classified, according to their stipulated applications, into fixed fund sources, current fund sources and specific fund sources. Fixed funds are to finance the acquisition of fixed assets; current funds are for the provision of current assets; and specific funds are earmarked for specific development projects. The principle of 'a specific fund for a specific purpose' has been rigidly adhered to by enterprises.

The Chinese term for the 'balance sheet', meaning 'a fund balance statement', reflects the fund management practice. It shows accounts of fund applications on one side and accounts of fund sources on the other, and contains three self-balanced sections. The sum of fixed assets and sum of fixed fund sources should be equal. A balance is also maintained between current assets and current fund source, as well as between specific fund assets and specific fund source. Keeping a strict balance between fund applications and fund sources has been a unique characteristic of China's accounting practices. Although the form, structure and content of the Chinese balance sheet are

Table 1
A Comparison of Fund Applications in Chinese Balance Sheet with Assets in Western Format of Balance Sheet

China: fund applications	Western: assets	Corresponding line
<i>Fixed assets</i>	<i>Current assets</i>	
1. Original cost of fixed assets	Cash	22+26
2. Less: depreciation	Accounts receivable	20+21+23+25+29
3. Carrying value of fixed assets	Inventory	
4. Fixed funds invested in other units	- Raw material	8+9+10+11+12+13
5. Construction prepayment	- Work in process	15
Subtotal of fixed assets	- Finished product	18
	Current investment	24+30+31
<i>Current assets</i>	Prepaid expenses	16
6. Sum of current assets with norm	Specific expenditure	28
7. A. Subtotal of current fund for procurement	Subtotal of current assets	
8. a. Raw material		
9. b. Fuel		
10. c. Packaging material		
11. d. Low cost and short lived articles		
12. e. Material on consignment for further process		
13. f. Material in transit		
14. B. Subtotal of current fund for production		
15. a. Work in process and self-manufactured semi-finished products		
16. b. Deferred charges and tax		
17. C. Subtotal of current fund for finished product	<i>Long-term assets</i>	
18 a. Finished products	Fixed assets	
19. Sum of other current assets without norm	Less: accumulated depreciation	1+27
20. Merchandise shipped	Net book value of fixed assets	2
21. Merchandise shipped on instalment sales		3
22. Monetary fund	Long-term investment	4+31
23. Trade accounts receivable and payment in advance	Long-term prepayment	
24. Current funds invested in other units	Subtotal of long-term assets	5
25. Other receivable		
Subtotal of current assets		
<i>Specific assets</i>		
26. Bank deposit under specific fund		
27. Physical assets under specific funds		
28. Specific project expenditure		
29. Receivables		
30. Specific fund source invested in other units		
31. Treasury bills		
Subtotal of specific assets		
32. Total fund applications		
Source: Lefebvre and Lin, 1990	Total assets	32

significantly different from those of a western one, the meaning of fund applications is very similar to that of assets, and fund sources might be seen as being comparable to the concepts of equity and liabilities in western terms (Zhou, 1988). A com-

parison of fund applications in the Chinese balance sheet with assets in the western format of the balance sheet by Lefebvre and Lin (1990) is shown in Table 1. Table 2 shows a similar comparison between fund sources in the Chinese balance sheet

Table 2

A Comparison of Fund Sources in Chinese Balance Sheet with Western Concept of Liabilities and Owners' Equity

China: fund sources	Western: liabilities and owners' equity
<i>Fixed funds</i>	<i>Liabilities</i>
1. State fixed fund	<i>Current liabilities</i>
2. Enterprise fixed fund	Accounts payable 10+11
3. Capital construction loans (fixed)	Accrued revenue 9+10
4. Fixed fund from other units	Accrued expense 12
Subtotal of fixed fund	Bank loans 7+8+17
	Tax payable 13
<i>Current funds</i>	<i>Long-term liabilities</i>
5. State current fund	Bank loans 3+7+8+17
6. Enterprise current fund	Other long-term liability 4
7. Capital construction loans (current part)	Subtotal of liabilities
8. Current funds loans	
9. Received payment for shipped merchandise on instalment sales	<i>Owners' equity</i>
10 Trade accounts payable and advances on sales	<i>State funds</i>
11. Other payable	Fixed fund 1
12. Accrued expenses	Current fund 5+14
13. Unpaid tax	Specific fund 16
14. Income yet to be remitted	<i>Enterprise funds</i>
15. Unappropriated retained profit	Fixed fund 2
Subtotal of current funds	Current fund 6
<i>Specific funds</i>	Specific fund 18
16. Specific state fund	<i>Retained profit</i>
17. Specific purpose loan	Subtotal of equity 15
18. Specific fund appropriated from retained profit	
Subtotal of specific funds	
19. Total fund sources	Total liabilities and equity 19
<i>Source: Lefebvre and Lin, 1990</i>	

and the western concepts of equity and liabilities.

Income Measurement

Although not explicitly established as a separate accounting subject matter, some generally accepted accounting principles were observed in various accounting regulations in determining profits (Zhao, 1988). These included the principles of accrual, consistency, revenue realisation, going concern, historical cost, and the distinction between capital and revenue expenditure. The concept of prudence was not accepted in China with regard to provision for probable losses. Enterprises were not allowed to provide for possible losses arising from obsolete stock and doubtful debts. This practice originated from a planned economy and historical cost basis of valuation (Zhao, 1988; Zhou, 1988). In a centrally planned economy, prices of commodities were strictly controlled by the central government, and hence price fluctuation was insignificant. Furthermore, the accounting regulations stipulated that assets should be reported on the basis of their historical cost,

and no other method of valuation was permitted. Another distinct difference between Chinese practices and western ones in cost ascertainment is the inclusion of interest and administrative expenses in product cost. This is referred to as the 'total costing method'.

Regulatory Framework of Accounting

There are essentially three levels of legislative power in China. According to the constitution, the National People's Congress is the only authority empowered to enact laws. The legislative body on the next level is the State Council, which may adopt administrative rules and regulations. The constitution further states that national ministries and commissions may issue directives and regulations on affairs within their jurisdiction.

In 1985, the National People's Congress adopted the *Accounting Law of the People's Republic of China*, the first accounting law since the People's Republic was established in 1949. The law contains six chapters (with 31 articles) as follows: general provision; sphere of accounting calcula-

tion, measurement and procedure; accounting supervision; accounting organisation and personnel; legal responsibility; and supplementary provision.

All state enterprises, state non-business units, government agencies and social organisations, and the armed forces should observe the law. The law served as a 'mother law' with which all other accounting regulations and systems must concur. It required these enterprises and organisations to adopt the uniform accounting regulations formulated by the Ministry of Finance (Article 14). It also allowed the functional departments of the State Council, provincial finance bureaus and agencies of local governments to formulate supplementary regulations to meet diverse business environments, provided they did not violate the fundamental principles of the law. It defined the functions of accounting officers to include accounting calculation and measurement, supervision of the legitimacy of enterprise's accounting-related activities, and the formulation of accounting systems appropriate for their enterprises. The legal liabilities of accounting personnel were identified and their legal rights were also protected by the law.

At the second level of legislation, the State Council issued two regulations relating to accounting: *Regulation on Cost Management of State-owned Enterprises* (1984), and *Tentative Regulation on Fixed Asset Depreciation for State-owned Enterprises* (1985). The former defined in detail cost elements, costing methods and responsibility of cost management, while the latter stated scope of depreciation, depreciation method and provided a detailed table of useful lives of major categories of fixed assets for depreciation purposes. These two regulations, while applicable to state enterprises, also served as a reference for collective enterprises.

The Ministry of Finance was empowered to administer accounting affairs at national level. In the early 1950s, it endeavoured to unify accounting practices by first developing accounting regulations for state enterprises engaging in specific industries. When collective ownership became increasingly important in the early 1980s, the Ministry of Finance issued corresponding accounting regulations for this sector of the economy. More than 40 accounting regulations came into force, prescribing all-embracing technical guidelines. They also formed the basis for accounting education. These regulations provided a uniform chart of accounts, definitions and explanations of terminology, explanations of rules for recording transactions, principles of assets valuation and income measurement, and a uniform format for the financial statements.

Uniform and rigid requirements for financial reporting were adopted. Pervasive adoption of industry-specific and ownership-specific accounting

regulation has been a unique feature of China's accounting system. The major task of accounting was the stewardship of public resources and observance of the state economic guidelines (Berry, 1988).

Following a successful experiment in some selected provinces, China put in force a tax system throughout the country in October 1984 to replace the profit remittance one. Tax laws have since played a significant role in financial reporting. The policy of public finance determines the taxation regulations, which in turn dictates the accounting rules (Tang et al., 1994). Rules for measuring accounting profits were the same as those for measuring taxable profit. Serving the information needs of the tax authorities thus became a major function of financial reporting.

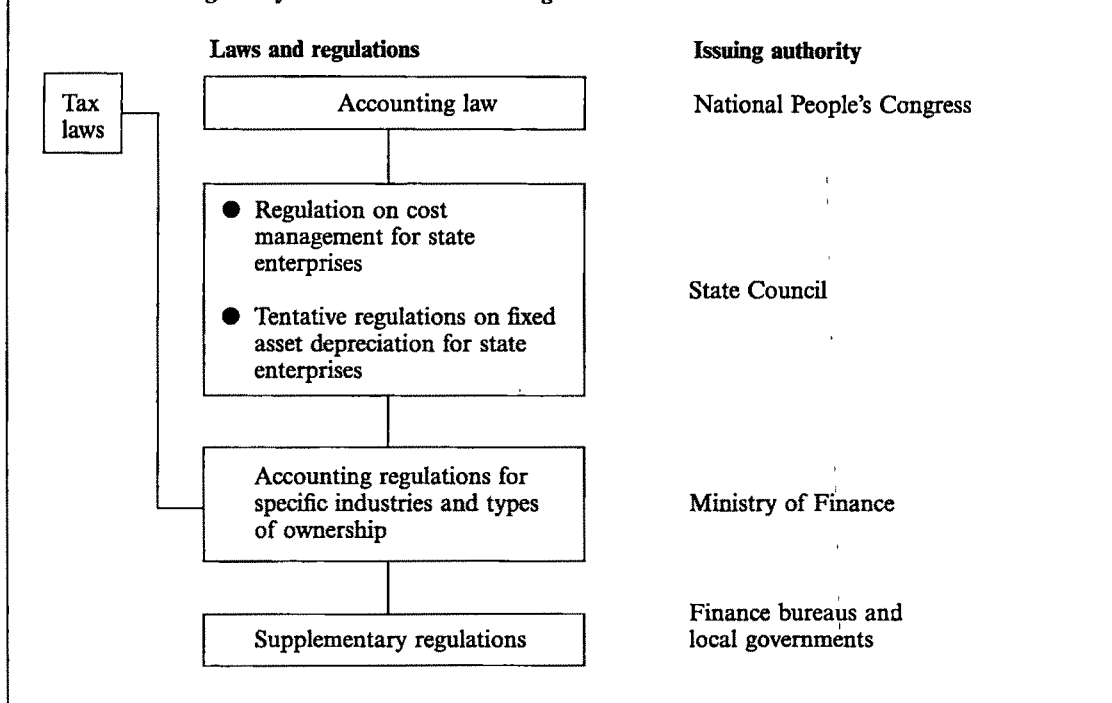
The traditional regulatory framework of accounting is summarised in Figure 1.

Accounting reforms

The economic and enterprise reforms have given rise to a drastic change in the accounting environment in China. To adapt to a market-orientated economy and reduce the reliance on state fund appropriations, enterprises were delegated with autonomy in operations and finance. Private enterprises and foreign-invested enterprises were also allowed to operate. Various forms of business combinations with joint ownership have emerged, and enterprises expanded their operations across industries. However, as the capital structure of enterprises developed into a more diversified ownership, the financial reports regulated by the Ministry of Finance geared to public ownership failed to meet the needs of other report users (Lefebvre and Lin, 1990). With increasingly complex business activities and less reliance on government fund allocations, the rigid, fund-orientated and industry/ownership-specific accounting practices became incompatible with the changing economic environment and in conflict with the objective of invigorating enterprises (Fang and Tang, 1991; Tang et al., 1994).

It was thus recognised that, in the process of economic reform, the user groups of accounting information had been broadened. The contradiction between the advance of economic reform and the lag of accounting development had become increasingly obvious (Fang and Tang, 1991). The infusion of foreign investment and international interactions in economic activities also served as an impetus for moving towards conformity with international accounting practices. It was against this background that the accounting reforms were embarked upon.

Figure 1
Traditional Regulatory Framework of Accounting



Evolutionary Phases of Accounting Reform

The accounting reforms commenced in the mid-1980s have gone through several phases, each guided by the economic and enterprise reforms (Yang, 1994; Winkle et al., 1994). These are detailed below:

Phase 1 (1985–1992). Accounting for foreign-invested enterprises. One of the key features of China's economic reform is allowing foreign investors to form joint ventures with Chinese enterprises or to establish wholly-owned subsidiaries in China. Two major forms of joint venture are operating in China, namely equity joint venture and cooperative joint venture. An equity joint venture is established as a separate legal entity with limited liability, in which partners share profits and losses in proportion to their equity ratio. A cooperative joint venture may be registered as an independent legal entity or as a non-legal entity, where profits and losses are shared in any proportion agreed by partners.

As foreign-invested enterprises are notably distinct from state enterprises in terms of their organisational and capital structure, the first phase of accounting reform started with formulating financial reporting requirements for this sector of the economy. In 1985, based on the *Law of the People's Republic of China on Joint Ventures Using Chinese and Foreign Investment* adopted by the National People's Congress in 1979, the Ministry of Finance promulgated the *Accounting Regulation*

for Joint Ventures Using Chinese and Foreign Investment (the 1985 Regulation).

Considering the need for foreign investors to consolidate China operations with their parent financial statements, the 1985 Regulation was established to a large extent by reference to international accounting practices. The 1985 Regulation, being the first attempt at harmonisation with international practices, departed from the fund-orientated accounting approach and adopted the financial statements widely used in western countries. It established the accounting elements, namely, assets, liabilities, capital, revenue and expenses, and adopted the western accounting equation (i.e., $\text{assets} = \text{liabilities} + \text{equity}$) for preparing financial statements. It also explicitly required the principles of historical cost, matching, consistency and revenue recognition. The principles of recognition and measurement for intangible assets were also established. In respect of income measurement, the 1985 Regulation required interest and administrative expenses to be excluded from product cost and treated as periodic expenses.

The 1985 Regulation required equity joint ventures established in China to prepare the following primary financial statements for submission to finance bureaus, tax authorities and government administering departments:

- a balance sheet;
- an income statement;

- a statement of changes in financial position or a cash flow statement.

The Ministry of Finance issued a uniform chart of accounts and format of financial statements which are similar to those adopted in western countries. Assets are classified into six major categories, namely current assets, long-term investments, fixed assets, construction in progress, intangible assets and other assets. Liabilities are classified into current liabilities, long-term liabilities and other liabilities. Capital or equity includes paid-up capital and reserves (Ministry of Finance, 1985).

The 1985 Regulation applied mainly to equity joint ventures, which at the time of promulgation of the regulations were the only form of foreign investment explicitly provided for in law. Other types of foreign investment, the cooperative joint ventures and wholly foreign-owned enterprises, were required to report their operations by referring to this regulation. The 1985 Regulation marked a significant breakthrough in China's accounting history by introducing western accounting practices and requirements to the foreign investment sector of the economy.

Since its promulgation, a series of laws relating to foreign investments have been enacted. The foreign exchange system has also evolved. In response to these developments, the Ministry of Finance has revised the 1985 Regulation regularly by issuing supplements. In 1992, the *Accounting Regulation for Enterprises with Foreign Investment* (the 1992 Regulation), applicable to all types of foreign-invested enterprises, was promulgated to replace the 1985 Regulation.

The 1992 Regulation moved a step further towards harmonisation with international accounting practices in the area of foreign currency transactions and translation. It is also the first time that provisions for possible losses arising from doubtful debts and obsolete stock have been allowed. Another significant change is that accounting for financial reporting purposes is now allowed to deviate from that required for taxation purposes. The formats for the balance sheet and income statement specified for industrial enterprises with foreign investment are shown in Appendices 1 and 2.

Phase 2 (1992). Accounting for share enterprises. The share capital system was first experimented with in 1984 as an initiative of enterprise reform to separate the ownership and management of enterprises. A share capital enterprise is established as a separate legal entity with full autonomy of operations. Share enterprises are classified into two categories. The first category is internal share companies which issue shares to their employees only. The second category is public companies which can invite the public to subscribe for their shares. Public companies may apply for the listing

of their shares on stock exchanges. A number of listed companies issued shares, designated 'type B shares', available only to foreign investors.

The establishment of the share capital system inevitably calls for a change in the objectives of financial reporting. The traditional accounting regulations geared to public ownership are inadequate for investors entering the emerging Chinese stock markets and for Chinese companies attempting to list on foreign stock exchanges (Winkle et al., 1994). In 1992, the Ministry of Finance issued the *Accounting Regulation for Experimental Share Enterprises*. As share enterprises do not operate on a fund allocation basis, the fund-oriented accounting requirements are not adopted. Instead, the Regulation requires the western type of financial statements, including a balance sheet, an income statement and a statement of changes in financial position (Ministry of Finance, 1992). The classification of assets, liabilities and equity is similar to that for enterprises with foreign investment. The Regulation thus became the first accounting regulation to apply international accounting principles to domestic enterprises. The formats of the balance sheet and income statement specified for share enterprises are shown in Appendices 3 and 4.

Phase 3 (1993). Accounting standards and new industry-based accounting regulations. Accounting academics in China have long been concerned with the lack of a set of complete and coherent accounting theories. Economic reform has presented a challenge to uniform and rigid accounting practices. It has also given rise to new accounting issues, such as accounting for business combinations, share issuance, hire-purchase and leases, etc. There was a call for establishing a conceptual framework which would provide a theoretical justification for accounting practices and serve as guidance for resolving contemporary accounting issues. To achieve this, accounting academics advocated the development of accounting standards to replace the rigid accounting regulations. This argument was supported by government officials, and in the late 1980s the Ministry of Finance embarked on a standard-setting project to establish accounting standards appropriate for China's socio-economic environment. Both academics and government officials generally agreed that the structure of accounting standards should consist of the following three levels (Tang et al., 1994):

- Basic accounting standards, dealing with fundamental assumptions underlying financial reporting, such as accrual basis, historical cost principle, reliability, comparability, and so on.
- Standards dealing with recognition and measurement of accounting elements.
- Operational standards dealing with specific transactions, such as depreciation, long-term contracts, inventory, foreign currency transactions, business combinations.

In 1992, the first accounting standard, entitled the *Accounting Standard for Enterprises* (the Standard), was issued by the Ministry of Finance and came into force on 1 July 1993.

The Standard broadens the traditional function of accounting in the provision of information for the government's decision-making on macroeconomic management by addressing the needs of external users in assessing an enterprise's financial position and operating results. It covers the following four main areas (Yang, 1994):

1. It establishes four accounting assumptions: accounting entity, going concern, periodicity and money measurement.
2. It identifies 12 basic principles: objectivity, relevance, comparability, consistency, timeliness, understandability, accrual basis, matching principle, conservatism, materiality, historical cost and distinction of capital and revenue expenditure.
3. It defines six accounting elements: asset, liability, owner's equity, revenue, expense and profit.
4. It requires three main accounting statements: balance sheet, income statement, statement of changes in financial position or cash flow statement.

The Standard, applicable to all enterprises established in China, supersedes in principle all other accounting regulations issued earlier. With the promulgation of the new accounting standard, the fund-orientated accounting regulations for public-owned enterprises which had been practised for decades were annulled. However, as it may take several years to develop a full set of operational accounting standards, the Ministry of Finance issued new industry-based accounting regulations for 13 industries as a transitional arrangement to provide technical guidelines. These new regulations integrate industrial characteristics and the requirements of the Standard, all effective on 1 July 1993. The 13 industries are manufacturing, merchandising, transportation, transportation (railway), transportation (airline), agriculture, postage and communication, real estate development, construction, banking and finance, insurance, tourism and catering, and foreign economic cooperation.

These new accounting regulations are similar to the old ones in that both provide detailed rules for the recording of transactions, a chart of accounts and the formats of financial statements. They are, however, distinctly different, as the new regulations are governed by the accounting standard and adopt western accounting methods and financial statements. The two accounting regulations promulgated in earlier phases, i.e. the *Accounting Regulation for Enterprises with Foreign Investment* and the *Accounting Regulation for Experimental Share Enterprises*, were also revised to ensure conformity

to the Standard. At this point, fund-orientated accounting practices ceased to exist in China.

Phase 4 (1994 onwards). A full set of accounting standards. Further development of accounting reforms will focus on the establishment in the next several years of a full set of accounting standards covering the measurement of individual accounting elements, preparation of financial statements, and accounting for specific business activities. On completion of this phase, the reforms in respect of financial reporting regulation will be essentially accomplished. It is planned that on the full implementation of accounting standards, the industry-based accounting regulations for the 13 industries will be phased out, and that financial reporting will be completely governed by accounting standards. This development reveals a significant move towards the Anglo-Saxon model of financial reporting regulation.

Regulatory Framework of Accounting

The accounting reform sets out a three-level regulatory framework of financial reporting. At the top level, the *Accounting Law* enacted by the National People's Congress in 1985 still serves as the mother law. The law was revised in December 1993 to remove clauses pertaining to the planned economy. Its applicability was also broadened to include private and foreign-invested enterprises.

The second level of the regulatory framework is accounting standards which are mandatory on all enterprises established in China. The industry-based accounting regulations promulgated by the Ministry of Finance, and those for share capital enterprises and foreign-invested enterprises, serve as the third level.

For share enterprises, the disclosure of operating results and financial position is further governed by the company law and relevant disclosure regulations. In December 1993, the National People's Congress adopted the *Company Law of the People's Republic of China*, effective on 1 July 1994. The law is applicable to companies with limited liability established in China. It requires a company to prepare the following financial statements (Article 175):

- Statement of assets and liabilities.
- Statement of profits and losses.
- Statement of changes in financial position.
- Explanation of financial conditions.
- Statement of profit distribution.

The law requires a company to appropriate 10% of profits per annum to statutory reserves, until they amount to 50% of the registered capital. In addition, the Securities Regulatory Commission (SRC), a commission established by the State Council, has issued tentative regulations relating to the disclosure requirements for the annual and interim reports of public companies. These regu-

lations require a company to submit financial reports to the SRC and stock exchanges within 120 days after the end of a financial year. The financial reports should be available at the company's registered office and stock exchanges for investors' inspection, and an abstract of these reports should be published in a national newspaper. A company's annual report should contain the following sections:

- Company's background information.
- Abstracts of key accounting data.
- Chairman's report.
- Board of directors' report.
- Financial statements.
- Disclosure of significant events.
- Related companies.

These tentative regulations will be incorporated into the securities law to be enacted and effective in late 1995.

In 1994, China launched a series of tax reforms, and a number of new tentative tax regulations were promulgated. The Ministry of Finance also issued some regulations relating to accounting for various taxes. However, as accounting for financial reporting purposes is now allowed to deviate from that for taxation purposes, the influence of tax laws and tax regulations on accounting will become somewhat lessened.

The new regulatory framework of accounting is depicted in Figure 2.

Evaluation of cultural constraints on the implementation of accounting reforms

After having implemented rigid accounting requirements for several decades, China intends to adopt the Anglo-American approach to the development of accounting standards for financial reporting purposes—but enforced directly by law. The industry-specific accounting regulations that have long been observed by accountants will be gradually phased out, when accounting standards have been fully developed, over a three-year period, as planned by the Ministry of Finance. Professional self-regulation and judgment in financial reporting will be promoted so that principles and alternatives recommended in accounting standards can be fully appreciated by accountants.

In this section, an attempt is made to analyse and evaluate from a cultural perspective the issues involved and prospects for the successful implementation of accounting reforms in China. The analysis adopts Hofstede's model of culture (Hofstede, 1980, 1984, 1987) and the accounting value dimensions suggested by Gray (1988). The analytical framework is depicted in Figure 3.

Hofstede's survey does not provide a direct assessment of China's cultural dimensions. The Chinese society is distinguished by the richness of its culture, which can be traced as far back as some

4,000 years ago in the Valley of the Yellow River. An attempt is made below to examine China's culture in the context of Hofstede's societal values.

Chinese societal values

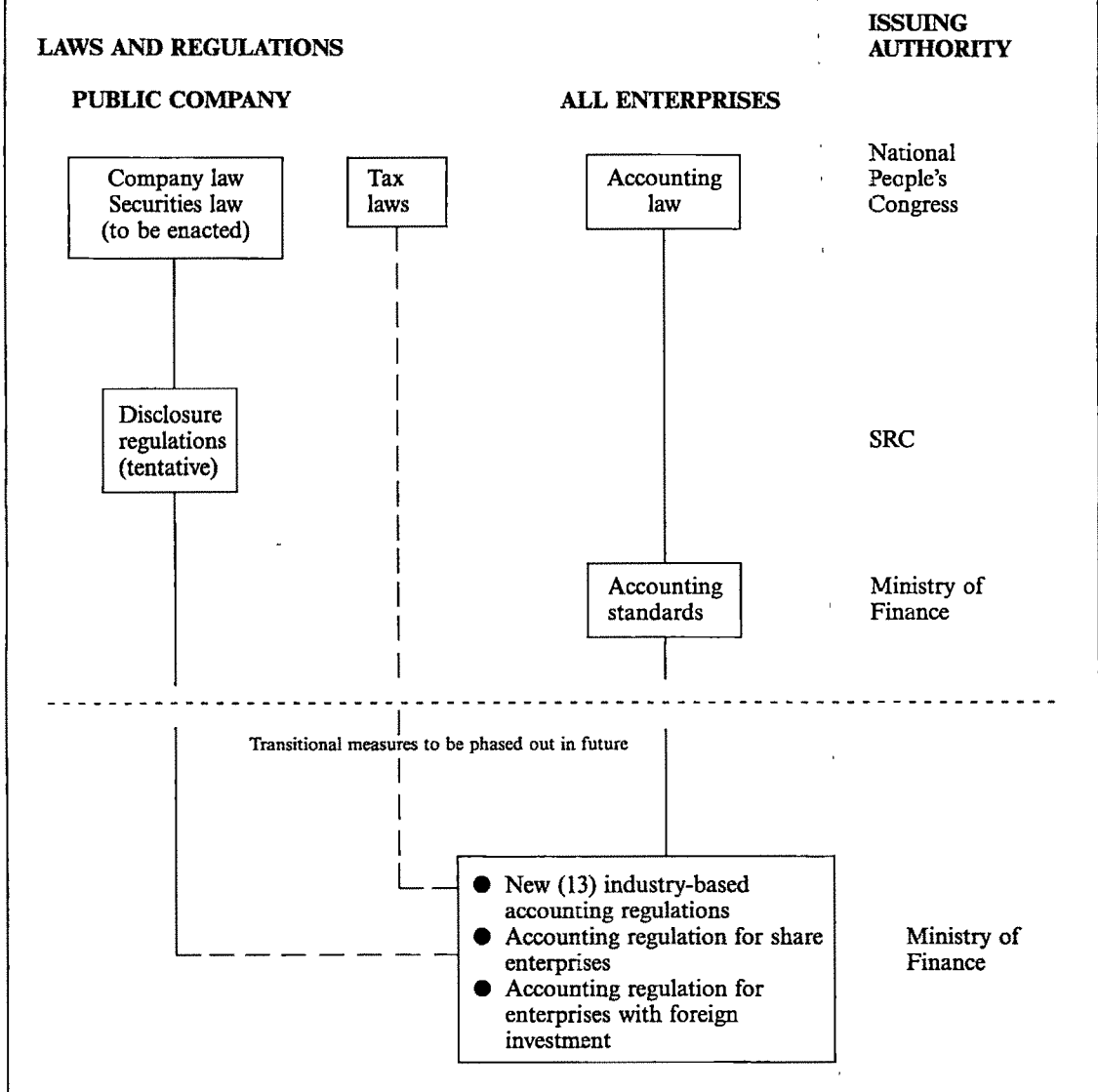
Power Distance

According to Hofstede, power distance is the extent to which the members of a society accept that power in institutions and organisations is distributed unequally (Hofstede, 1980, 1984). Chinese society has been characterised by its structure of social stratification, exhibiting a 'differential mode of association' (Fei, 1992). In ancient Chinese agricultural society, people were classified into four classes (Cheng, 1980). The first and noblest of them were the gentry, because they were educated and therefore respected. The others were, in order of social status, farmers, artisans and merchants. This early form of the stratified society laid the foundations for the Chinese culture which has been preserved and spread by Confucianism (Cheng, 1980).

The essence of Confucianism lies in the family system. 'The central tenets of the Confucian were loyalty to the ruler and filial piety to one's parent' (Wang, 1991, p. 169). The Chinese family is a society in miniature (Cheng, 1980). It enforces filial piety, under which children are taught to render their parents absolute obedience. The father is a supreme autocrat with full control over the family's income, properties and decisions relevant to family members. Family members are assigned proper hierarchical order according to age and generation, two paramount factors which form the foundation for hierarchy of status and authority in a family. This family culture forms the foundation for loyalty and obedience to the superior and ruler.

In addition, Confucianism codifies five types of social relationships: relationships between the ruler and subject, father and son, elder brother and younger one, husband and wife, and between friends (Fei, 1992). 'These relationships are based on mutual and complementary obligations' (Hofstede, 1991, p. 165). Members of the society should know their own position in the whole societal set-up, and behave in a manner consistent with the expected code of conduct. The society emphasised the ordering of relationships and the observing of this order. 'The stability of society is based on unequal relationships between people.' (Hofstede, 1991, p. 40). In general, the subordinate owes the superior respect and obedience, while the superior owes the subordinate protection and consideration. Reflected in the governmental set-up, the attitude that power, because it is assumed to be superior, should not be challenged, is still inherent in the country's strongly centralised form of government (Kong, 1989).

Figure 2
New Regulatory Framework of Financial Reporting



A significant national characteristic in Chinese society is the tradition of bureaucracy with a highly structured centralised administrative system (Berry, 1988). In Hofstede's terminology, China is a society with large power distance, in which, as described by Hofstede, people accept a hierarchical order in which everybody has a place, which needs no further justification (Hofstede, 1980, 1984).

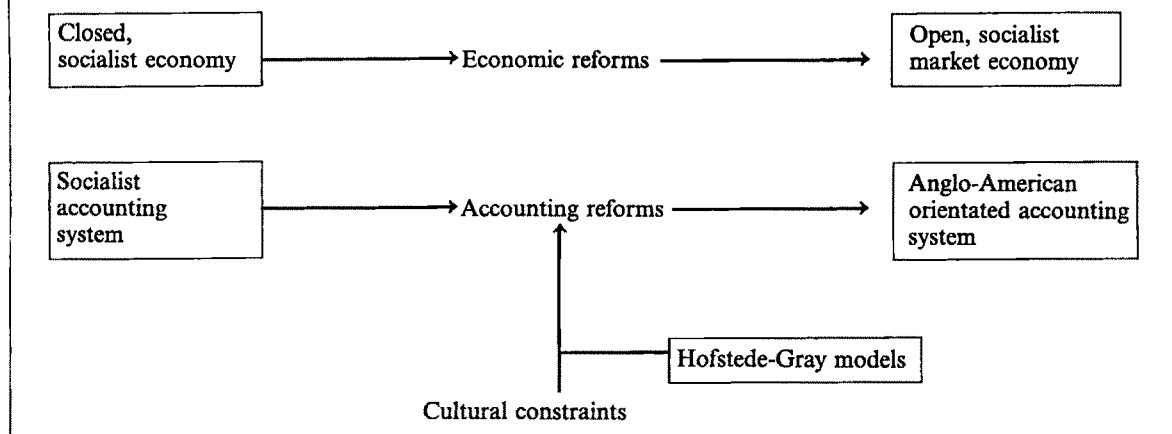
Collectivism

In Hofstede's model, individualism and collectivism refer to the degree of interdependence a society maintains among individuals (Hofstede, 1980; 1984). Traditionally, people in Chinese ag-

ricultural villages belonged to a group of family units that were linked to one another by kinship. The network of kinship can be extended to embrace even more distant relatives to form a 'lineage' (Fei, 1992). An individual is locked into a cohesive family structure which cultivates collective consciousness and responsibility (King and Bond, 1985). Chinese people have a strong sense of belonging to a group. The structural effects of families account for the development of a social orientation towards authority and a group orientation towards the family (Yang, 1959).

Harmony in the family is stressed in Chinese culture. There is a deep-seated belief that a harmonious family flourishes and prospers. When

Figure 3
Analytical Framework of Cultural Constraints on Accounting Reforms in China



conflict arises between family members, it is resolved through self-sacrifice of the individual for the interest of the group (Yang, 1959). A strong sense of obligation and responsibility to one's family and group is cherished as a Chinese virtue.

While Confucianism encourages development of such virtues as respect, humility and obedience, it also delineates specific social roles for an individual. An individual is expected to play a proper role under the kinship system rather than to develop one's own self. 'Thus children should learn to restrain themselves, to overcome their individuality so as to maintain harmony in the family' (Hofstede, 1991, p. 165). The insistence on authority, conformity and social order further stifles individual expression (Kong, 1989). This culture was reinforced by the Marxian value connected with the principle of security of each member of society, which involves being able to rely on the larger community for help in time of need (Berry, 1988). This reflects the societal value of collectivism in Chinese society.

Uncertainty Avoidance

Uncertainty avoidance is the degree to which members of a society feel uncomfortable with uncertainty and ambiguity (Hofstede, 1980; 1984). In China, another important impact on culture is religion. 'In the distant past, the worship of nature permeated every aspect of Chinese culture' (Kong, 1989, p. 63). In Chinese thought, heaven and earth represent primary forces in nature. It was natural that these forces were worshipped for their super powers. Given this background, it is easy to understand the Chinese adoration of many aspects of nature: the sun, the moon, wind, mountains, rivers and forests. This has gradually developed into a superstitious form of worship and reflects the fact that the Chinese by nature have a strong inclina-

tion to avoid uncertainty.

In contrast to the western approach, which encourages curiosity and experimentation in acquiring knowledge, Chinese teaching relies heavily on reference to tradition and discourages the pursuit of original thought (Kong, 1989). Confucius had great respect for the body of rules, known as 'rites', which governed action in every aspect of life and was regarded as the way to achieve harmony (Lau, 1992). 'Rites' means conforming with the norms prescribed for an individual's role in the society. Children are trained to adhere to socially desirable and culturally approved behaviour. This social framework, which cannot allow people's conduct to deviate from the prescribed code, also evidences a strong uncertainty avoidance societal value.

Masculinity

Masculinity and femininity refer to the dimension in which a society differentiates the social roles of sexes and the extent to which achievement, heroism, assertiveness and material success is stressed (Hofstede, 1980; 1984). In a more masculine society, both men and women hold tougher values and learn to be ambitious and competitive (Hofstede, 1991). Chinese culture classifies human behaviour into three categories: the aggressive, the restrained and the passive. An ideal person, according to Confucius, is one who exhibits self-restraint (Kong, 1989). To learn self-control and emotional restraint at an early stage, children are punished for aggressive behaviour. Children who have grown up in extended Chinese families learn to resolve conflicts by compromise rather than by fighting them out. The Chinese pattern of behaviour was labelled as 'moderation, balance and harmony' (King and Bond, 1985). Achieving harmony

in society and with nature has been a fundamental theme of Chinese culture.

Material success is not a dominating social value in Chinese society. This is witnessed by the low status of the merchant in the stratified traditional social class. Merchants might be well dressed, but were despised by Confucian scholars as they smelled like 'copper cash' (Cheng, 1980). Being able to be fully engaged in scholarly pursuits rather than material success was regarded by people as the best quality of life. A modest scholar was most respected and admired. This reveals a preference for femininity in Chinese society where there is a preference for modesty, quality of life rather than achievement in terms of material success.

Long-term Orientation

Based on the teachings of Confucius, another dimension of culture referred to as the 'Confucian dynamism' dimension has been identified (Hofstede, 1991) to delineate the Chinese way of thinking. This dimension was renamed by Hofstede as a long-term versus short-term orientation in life (Hofstede, 1991). It discriminates societal values that are more dynamic and more towards the future (i.e. long-term oriented) from those that are more static and orientated more towards the past and present (i.e. short-term orientation). As a long-term oriented society, Chinese culture values thrift and perseverance. Chinese people are tenacious in pursuing goals. They are also thrifty in order to conserve resources for future needs. This forward-looking way of thinking is in contrast to that in the US and western countries where, evidenced by a low rate of savings as a share of gross national product, consumer spending seems to be an important value in society and where short-term performance is more highly rated.

From the above analysis and Hofstede's survey, it can be concluded that Chinese culture is remarkably distinct from Anglo-American culture. A comparison of societal values between China and both the US and the UK is shown in Table 3.

Accounting values and accounting systems/practices

In an attempt to relate societal values with an accounting sub-culture, Gray (1988) argued that if Hofstede has correctly identified significant cultural value dimensions, then it should be possible to establish their relationship to accounting values. 'If such a relationship exists, then a link between societal values and accounting systems can be established and the influence of culture assessed.' (Gray, 1988, p. 6). Gray identified four key accounting values that could be linked to societal values (see Figure 4). The first two values, professionalism versus statutory control and uniformity versus flexibility, are relevant to the authority for accounting systems and their enforcement, i.e. the extent to which such systems are determined by government relative to the accounting profession and the degree of preference for the enforcement of uniform accounting methods compared to a more flexible approach.

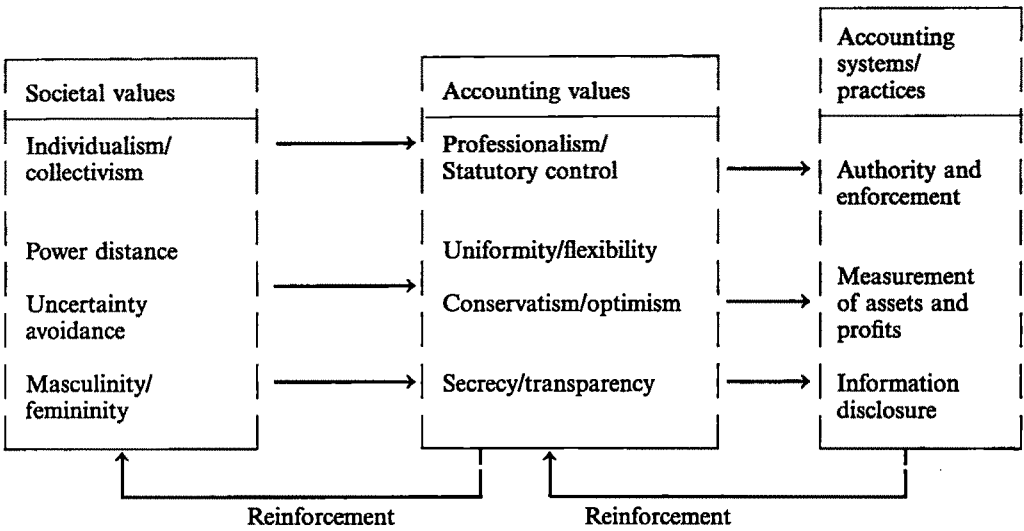
The third value, conservatism versus optimism, is relevant to the issue of measurement, i.e. the extent to which there is a preference for a more cautious approach so as to cope with the uncertainty of future events compared to a more optimistic laissez-faire risk-taking approach. The fourth value, secrecy versus transparency, is relevant to the issue of information disclosure, i.e. the extent to which there is a preference for confidentiality and the restriction of disclosure of information about the business compared to a more transparent, open and publicly accountable approach.

Gray's analysis of the link between societal and accounting values provided a number of hypotheses relevant to predicting the likely nature of accounting systems in a comparative international context. In societies that tend to be collectivist with relatively large power distance, it is suggested that there is likely to be a preference for an emphasis on government involvement and statutory control rather than the independent professionalism of a respected accounting profession. There is

Table 3
A Comparison of Societal Values

<i>Hofstede's societal value</i>	<i>China</i>	<i>US/UK</i>
Power distance	Large	Small
Individualism/collectivism	Collectivism	Individualism
Uncertainty avoidance	Strong	Weak
Masculinity/femininity	Less masculinity	More masculinity
Long-term/short-term orientation	Long-term	Short-term

Figure 4
Gray's Accounting Dimensions and Measurement and Disclosure



also likely to be a preference for a more uniform and detailed approach to regulation rather than a more flexible self-regulatory professional emphasis. Further, where strong uncertainty avoidance and a long-term orientation is also evident, then measurement practices will tend to be relatively conservative. In such societies there will also tend to be a more secretive approach to the disclosure of information. The relationship between Gray's accounting values and Hofstede's cultural values is shown in Table 4, and the situation of China in respect of the influence of accounting values on these key accounting system dimensions is now examined.

Statutory Control and Uniformity

China, a society with large power distance, practises a high degree of centralisation of authority. This indicates a favourable environment for legal and government control in accounting (Gray, 1988). The *Accounting Law of the People's Republic of China* stipulates that the administration of accounting affairs is governed by the Ministry of Finance and finance bureaus of local governments (Article 5), and national uniform accounting regulations are formulated by the Ministry of Finance (Article 6).

In the private sector, the Accounting Society of China (ASC), originally formed in 1950, was the

Table 4
Relationships between Gray's Accounting Dimensions and Hofstede's Cultural Dimensions

Cultural values (Hofstede)	Accounting values (Gray)			
	Statutory control	Uniformity	Conservatism	Secrecy
Power distance	+	+	?	+
Uncertainty avoidance	+	+	+	+
Collectivism	+	+	+	+
Masculinity	?	?	-	-
Long-term orientation	?	?	+	+

Note: '+' indicates a direct relationship between the relevant variables; '-' indicates an inverse relationship. Question marks indicate that the nature of the relationship is indeterminate.

Source: Adapted from Baydoun and Willett (1955).

first national organisation devoted to the development of the accounting profession. It was suspended during the Cultural Revolution in the mid-1960s. When it was re-established in 1980, it soon became a large society with branches throughout the country (Zhou, 1988). The ASC is an academic association (the majority of its members are accounting academics) which aims to promote accounting research, publication, conferences and education. The Society is similar in its goals to the British Accounting Association in the UK and the American Accounting Association in the US (Zhou, 1988). The Society first initiated an inquiry into accounting standards in 1987, and formed a research group on this issue with the aim of establishing a conceptual framework of accounting and promoting accounting standards-setting in China (Tang et al., 1994).

Soon after the ASC's initiative, the Ministry of Finance formed a working group and formulated a plan for the development of accounting standards. The Ministry of Finance made clear that it would be the authoritative body to issue and enforce these. The ASC thus realised that, in China, the accounting profession could not obtain an authoritative status like the Financial Accounting Standards Board (FASB) in the US or the professional status enjoyed by its counterparts in other Anglo-Saxon countries in setting standards. ASC research publications can only serve as an input to official regulations and standards.

Substantial government involvement in the accounting profession also witnesses a strong statutory control of accounting activities. With the revival of the CPA system in 1980, the first local institute of certified accountants was formed in Shanghai in 1987, and a national institute, the Chinese Institute of Certified Public Accountants (CICPA) was established in 1988 (Fang and Tang, 1991). Local institutes of certified public accountants have since been established in various provinces. The chairman of the institute is the vice-minister of the Ministry of Finance in charge of accounting affairs. In addition, a number of officials from the Ministry act as advisers or council members of the institute. Despite the Ministry of Finance's endeavour to promote the institute as independent of the government, this set-up suggests that it is an official agency, rather than an autonomous body.

The *Law of Certified Public Accountants* issued in 1993 prescribes that the Ministry of Finance and provincial finance bureaus are charged with supervising certified public accountants, accounting firms and the local and national institutes of certified public accountants (Article 5). The Ministry of Finance is responsible for developing the national uniform CPA examination (Article 7) and approval of the establishment of CPA firms (Article 25). The CICPA does not have any authority

to issue accounting regulations or standards. The authority of the CICPA is limited to assisting the Ministry of Finance in organising national unified CPA examinations, approving the registration of CPAs and formulating codes of conduct for CPAs. CPA firms are established with limited liability by sponsorship of institutional units, including universities, finance bureaux and industrial bureaux. The Ministry of Finance and local finance bureaux operate several CPA firms.

This raised question marks over the independence of CPA firms. Although the *Law of Certified Public Accountants* allows the establishment of partnership CPA firms with unlimited liability, such CPA firms are scarce in number. Thus it is sufficiently clear that it is the bureaucratic authority of the state, rather than an autonomous organisation in the private sector, which governs the accounting system and CPAs' activities.

While China is moving towards an Anglo-American approach to the development of accounting standards, statutory control and uniformity are nevertheless pervasive. The *Accounting Standard for Enterprises*, which serves as an accounting conceptual framework, is legally enforceable. In contrast, similar pronouncements in western countries, such as the statements on the conceptual framework issued by the FASB, are not regarded as accounting standards and are thus not enforceable. The Standard also contains some bookkeeping rules, such as the requirement to adopt debit/credit (rather than increase/decrease) bookkeeping, deduction of sales returns and discounts from revenue, periodicity convention and monthly calculation of product costs. The inclusion of such provisions is to ensure uniformity. This suggests that accounting standards development is pervasively influenced by its accounting culture of a mandatory and uniform approach.

Statutory control and enforcement of accounting systems echo the Confucian heritage of the hierarchical nature of society. Given this cultural environment, and even with the rapid development of the professional bodies in the 1980s, it is predicted that the authority for accounting systems and their enforcement will remain a governmental and legalistic function.

In a culture scoring high on the uncertainty avoidance scale, one can expect more formalisation in accounting practices in China (Gray, 1988). This is evidenced by its adoption of accounting regulations that are prescriptive in a considerably more detailed manner than those in the Anglo-American countries. Professional self-regulation and its associated flexibility will not therefore have anything like the importance and acceptance it has in the Anglo-Saxon countries.

The development of the Chinese accounting profession has in fact experienced disastrous interruptions. The CPA system was suspended soon af-

ter the People's Republic was founded. In the late 1950s, the advocate of a concept known as 'accounting without books' during the 'Great Leap Forward' period led to the elimination of accounting journals and ledgers, resulting in great confusion in accounting work (Zhao, 1988). Accounting education was further retarded during the 10-year Cultural Revolution. Accounting techniques were denounced as counter-revolutionary and accounting was required to be simple and easily understood by everyone (Zhao, 1988; Tang et al., 1994).

The professional status of accountants has not been well recognised in China. Prior to the issue of the *Accounting Law*, little protection was provided for accountants in discharging their duties. Senior officials in the enterprises might intimidate or take revenge on accountants for attempting to curb their illegal economic activities (Zhou, 1988). The *Accounting Law* now stipulates that for appointment, removal and dismissal of accountants in charge in a state enterprise, prior approval of the supervising government institutions must be obtained (Article 23).

To rectify a shortage of accountants badly needed for economic reform, a uniform national grading system for accounting personnel is implemented jointly by the Ministry of Personnel and the Ministry of Finance. The four grades are bookkeeping at the lowest level, assistant accountant, accountant and senior accountant at the highest level (Tang et al., 1994). Grading had been based on evaluation of both academic qualifications and working experience, until 1993, when a nationwide examination was introduced to replace it. The *Accounting Law* (Article 21) stipulates that medium and large enterprises may establish a chief accountant, a post which must be held by an accountant or senior accountant. The Chinese Institute of Chief Accountants was set up in 1990 to provide a vehicle for sharing experience and promoting professional standards. In the certified public accountant stream, similarly, a national CPA examination was first organised by the CICPA in 1991 to replace the evaluation system adopted in the 1980s.

A relatively low degree of professionalism in the accounting sub-culture is anticipated in China, which has a collectivism-orientated societal value. In such a culture, independence, belief in individual decisions and respect of individual endeavour are not emphasised (Gray, 1988). Professional judgment has not been appreciated in accounting education, which has been based on an over-specialised and industry-orientated accounting curriculum (Tang et al., 1994; Winkle et al., 1992). The application of rigid and uniform accounting regulations has also not encouraged accountants to equip themselves with comprehensive analytical skills. As a result, accounting work is performed

mechanically, complying with detailed regulations. Accuracy, compliance, completeness and legitimacy are of major concern.

Against this background of professional development, the Ministry of Finance enforced the first accounting standard in July 1993. Notwithstanding mass-scale training programmes organised throughout the country, accountants found it difficult to integrate the principles, concepts and definitions in the accounting standard with their daily accounting work. The promulgation of new accounting regulations for 13 industries, to provide detailed technical guidelines with which accountants are comfortable, again evidences the influence of strong uncertainty avoidance in the society.

In contrast, in Anglo-Saxon countries, professionalism is high on the scale where accountants are perceived to adopt independent attitudes and to exercise their individual professional judgments to a great extent. With a different accounting culture in this dimension, the likely success of China's intention to move towards the Anglo-Saxon model of financial reporting is open to question. It is predicted that the industry-based accounting regulations will continue to serve the accounting community for a long time, until society becomes more tolerant of deviant ideas and comfortable with professional judgment.

Conservatism

As a society of strong uncertainty avoidance and with a long-term orientation, China adopts a conservative approach both in accounting measurement and in adopting new accounting practices. This preference for more conservative measures of profits and assets is consistent with strong uncertainty avoidance, stemming from a concern with security and a perceived need to adopt a cautious approach to cope with the uncertainty of future events (Gray, 1988). The historical cost principle is pervasive in asset valuation. Regular revaluations of assets and investments are not allowed. At the same time, the Ministry of Finance has been cautious in introducing new accounting practices. An example is the recognition of possible losses arising from obsolete inventory and uncollectable debts. The *Accounting Regulation for Joint Ventures Using Chinese and Foreign Investment* (1985), although marking a breakthrough in harmonisation with international practice, prohibited recognition of possible losses in these two areas. Given an increasing relaxation of commercial credits and greater orientation towards a market economy in China, business operations are now more exposed to risks of market price fluctuation and customers' credit uncertainty. Despite persistent pleas by enterprises, in particular the foreign investment sec-

tor, to remove this prohibition, the Ministry of Finance has been very cautious in making such a move. Its major consideration has been concerned with the impact on taxation revenues. It was not until 1992 that the regulation on *Accounting for Enterprises with Foreign Investment* was issued, allowing the provision for possible losses, although this was limited to a certain percentage of the reported value of accounts receivable.

The Ministry of Finance has also been cautious in allowing depreciation methods other than the straight-line basis. The *Income Tax Law on Enterprises with Foreign Investment and on Foreign Enterprises* (1991) stipulates the straight-line method, and lays down the minimum depreciation period for each major category of fixed assets. Approval must be sought for adopting accelerated depreciation or changing depreciation methods. Thus the taxation system is an inhibiting factor on accounting development, though this is likely to be less influential in the future. Taken overall, the Chinese approach to measurement tends to be relatively conservative and is likely to be more so in the future.

Secrecy

A society with large power distance and strong uncertainty avoidance like China's means the preference for secrecy is relatively high. Thus the effect on the degree of disclosure will be negative (Gray, 1988). On the other hand, the collectivist culture requires business enterprises to be accountable to society by way of providing information. Therefore, the government has to intervene and prescribe certain disclosure requirements. In the past, access to accounting information, particularly in the public-ownership sector, has been almost out of the question. With the development of share capital enterprises, the need to disclose more information to investors for decision-making purposes and to monitor the company's performance has been called for. The accounting standard and the new industry-based accounting regulations do not contain provisions pertaining to disclosure requirements.

The *Company Law* enacted in 1993 stipulates the financial statements required for limited liability companies without delineating the contents of these statements. More detailed disclosure requirements for public companies are contained in the tentative regulations issued by the Securities Regulatory Commission. However, compared with those in Anglo-Saxon countries, the disclosure requirements in China are relatively limited, and voluntary disclosure has not been called for. For instance, there are no disclosure requirements for the liabilities secured on company's assets, the general nature of contingent liabilities, market value of investments, details of the classes and numbers of

convertible securities, particulars of any contracts of significance with subsidiary companies, significant post balance sheet events, etc. This supports Jaggi's (1975) premise that accounting disclosure may be less in developing countries because of differences in managers' value orientation.

Conclusion

The accounting debates in China in the early 1990s have focused on internationalism versus nationalism. According to the Hofstede (1980) and Gray (1988) cultural models, China's accounting development and practice should be in the cluster that supports statutory control, uniform practices, a conservative measurement approach and secrecy in disclosure. This is supported by the foregoing analysis of the authority for accounting systems, the accounting profession and accounting measurement and disclosure in China. However, the adoption of accounting standards in 1993 marked a dramatic turning point in China's accounting history, from a rigid and uniform approach towards a more international Anglo-Saxon orientation.

The first accounting standard has been developed by reference to the FASB's conceptual framework, and the other standards will be formulated mainly by referring to International Accounting Standards (Yang, 1994). But moving towards an Anglo-Saxon model of financial reporting which emphasises professional self-regulation and judgment will, on cultural considerations, be very difficult to achieve in practice. It is predicted, therefore, that accounting standards and industry-based accounting regulations will co-exist. The former provide general principles, i.e. are principle-orientated, while the latter lay down detailed technical guidelines, i.e. are rule-orientated, and are all legally enforceable. Thus, accountants will continue to rely heavily on detailed accounting rules in the foreseeable future.

Given the cultural influence, such a mixed orientation seems likely to prove to be a necessary feature of accounting in China. While Chinese accounting will continue to be characterised by statutory control, uniformity and a tendency towards conservatism and secrecy, it will be dressed with an Anglo-Saxon flavour. This Anglo-Saxon flavour is likely to be more pronounced for those companies seeking foreign capital, where the pressures to comply with international investor demands will be greater. This approach is consistent with the Chinese environment and culture, and thus constitutes China's unique national identity in terms of its accounting and financial reporting system.

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Appendix 1

ENTERPRISES WITH FOREIGN INVESTMENT BALANCE SHEET

ASSETS	Line number	At beginning of year	At end of period	LIABILITIES AND INVESTORS' EQUITY	Line number	At beginning of year	At end of period
Current Assets				Current Liabilities			
Cash on hand				Short-term loans			
Cash in bank				Notes payable			
Marketable securities				Accounts payable			
Notes receivable				Accrued payroll			
Accounts receivable				Taxes payable			
Less: Provision for bad debts				Dividends payable			
Prepaid income tax				Advances from customers			
Advances to suppliers				Other payables			
Other receivables				Accrued expenses			
Deferred and prepaid expenses				Staff and workers' bonus and welfare fund			
Inventory							
Less: Provision for loss on realization of inventory							
TOTAL CURRENT ASSETS				TOTAL CURRENT LIABILITIES			
Long-term Investments				Long-Term Liabilities			
Long-term investments				Long-term loans			
Fixed Assets				Debentures payable			
Fixed assets - cost				Premium (discount) on debentures payable			
Less: Accumulated depreciation				Other Liabilities			
Fixed assets - net value				Exchange gain during start-up period			
Construction in Progress				Deferred gain on investments			
Construction in progress				TOTAL LIABILITIES			
Intangible Assets				Investors' Equity			
Land occupancy right				Registered capital			
Proprietary technology and patents				(currency and amount)			
Other intangible assets				Paid-in capital			
TOTAL INTANGIBLE ASSETS				(amount of foreign currency at end of period)			
Other Assets				including			
Organization expenses				Chinese investment			
Exchange loss during start-up period				(amount of foreign currency at end of period)			
Deferred loss on investments				Foreign investment			
Other deferred expenses				(amount of foreign currency at end of period)			
TOTAL OTHER ASSETS				Less: Investment Returned			
				Capital surplus			
				Reserve fund			
				Enterprise expansion fund			
				Profits capitalised on return of investment			
				Current year profit			
				Undistributed profits			
TOTAL ASSETS				TOTAL INVESTORS' EQUITY			
				TOTAL LIABILITIES AND INVESTORS' EQUITY			

Appendix 2

**ENTERPRISES WITH FOREIGN INVESTMENT
INCOME STATEMENT**

ITEMS	Line number	Current period	Current year cumulative	Last year cumulative
Sales				
Including: Export sales				
Less: Sales discounts and allowances				
Net sales				
Less: Sales tax				
Cost of sales				
Including: Cost of export sales				
Gross profit on sales				
Less: Selling expenses				
General and administrative expenses				
Financial expenses				
Including: Interest expenses (less interest income)				
Exchange loss (less exchange gains)				
Profit on sales				
Add: Income from other operations				
Operating profit				
Add: Non-operating income				
Less: Non-operating expenses				
TOTAL PROFIT				
NOTES: 1. Export sales : (1) foreign currency (name and amount) translated into recording currency. (amount) (2) foreign currency (name and amount) translated into recording currency. (amount) 2. Domestic sales : (1) foreign currency (name and amount) translated into recording currency. (amount) (2) in foreign exchange certificate.				

Appendix 3

SHARE CAPITAL ENTERPRISES
BALANCE SHEET

ASSETS	Line number	At beginning of year	At end of period	LIABILITIES AND SHAREHOLDERS' EQUITY	Line number	At beginning of year	At end of period
Current Assets				Current Liabilities			
Cash	1			Short-term loans	41		
Marketable securities	2			Notes payable	42		
Notes receivable	3			Accounts payable	43		
Accounts receivable	4			Advances from customers	44		
Less: provision for bad debts	5			Staff and Workers' Welfare fund	45		
Accounts receivable - net	6			Dividend payable	46		
Advances to suppliers	7			Taxes payable	47		
Other receivables	8			Other liabilities	48		
Deferred expenses	9			Provision for expenses	50		
Inventory	10			Value-added tax	51		
				Long-term liabilities due within one year	52		
TOTAL CURRENT ASSETS	15			TOTAL CURRENT LIABILITIES	55		
Long-Term Investments				Long-Term Liabilities			
Long-term investments	16			Long-term loans	56		
Fixed Assets				Debentures payable	57		
Fixed assets at cost	18			Long-term payables	58		
Less: Accumulated depreciation	19						
Fixed assets - net value	20						
Construction in progress	21						
Fixed assets disposal	22						
TOTAL FIXED ASSETS	25			TOTAL LONG-TERM LIABILITIES	65		
Intangible and Other Assets				Shareholders' Equity			
Intangible assets	26			Share capital	66		
Organisation costs	30			Capital reserve	67		
Long-term deferred expenses	31			Revenue reserve	68		
				Staff welfare reserve	69		
				Undistributed profit	70		
TOTAL INTANGIBLE AND OTHER ASSETS	35			TOTAL INVESTORS' EQUITY	75		
Loss on Assets Pending for Disposal							
Loss on current assets pending disposal	36						
Loss on fixed assets pending disposal	37						
Total loss on assets pending disposal	38						
TOTAL ASSETS	40			TOTAL LIABILITIES AND INVESTORS' EQUITY	80		

Appendix 4

SHARE CAPITAL ENTERPRISES
INCOME STATEMENT

ITEMS	Line number	Month	Cumulative
1. Major operating income	1		
Less: Operating cost	2		
Selling expenses	3		
Administrative expenses	4		
Financial expenses	5		
Purchasing expenses	6		
Sales tax	7		
2. Major operating profit	8		
Add: Other operating income	9		
3. Operating profit	10		
Add: Investment income	11		
Non-operating income	12		
Less: Non-operating expenses	13		
4. TOTAL PROFIT	14		

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Contents

Budgetary Control of Hospitals — Ritual Rhetorics and Rationalized Myths?

by INGER JOHANNE PETTERSEN

Corporate Governance, Financial Reporting, and the Cost of Containing the AIDS Threat in Scotland

by B.M. CRAVEN AND G.T. STEWART

Accounting for Contributed Services: The FASB's Conceptual Confusion

by SUSAN M. NEWBERRY

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Commonalities Between Added Value Ratios and Traditional Return on Capital Employed

M. F. C. Kwong, J. W. Munro and K. V. Peasnell*

Abstract—This paper provides an empirical comparison between two versions of a new accounting ratio devised by Kay and Davis (1990a, 1990b) and Kay (1993) and the traditional capital employed (ROCE) ratio. The new measures, 'added value on inputs employed' (AVIE) and 'added value on net output' (AVNO), are both based on a version of residual income they label 'added value', but differ in choice of scaling variable. Empirical evidence is provided in this paper on AVIE and AVNO, including cross-sectional patterns, distributional properties, sensitivity to alternative specifications, and rank-ordering and serial-correlation performance compared with ROCE. AVIE and AVNO differ markedly from ROCE in terms of absolute levels and account for at most half of the latter's cross-sectional variation. On the other hand, the results indicate that both the rank orderings and rank predictions of the different measures are very similar. The distributional properties of the added value ratios are sensitive to choice of scaling variable, suggesting that considerable care has to be exercised in drawing conclusions from the absolute rankings of these measures. The new added value ratios provide signals about firm rankings that differ only to a limited degree from those rendered by the traditional ROCE ratio.

Introduction

Return on capital employed (ROCE) is an accounting ratio that appears to be widely used by management and investors as a summary indicator of business success. While usually warning readers about ROCE's weakness for such a purpose, accounting and financial statement analysis textbooks continue to include it in the financial analyst's battery of ratios. Few competitor measures that can be derived from accounting data have appeared in the literature.

An exception¹ is the suggestion by Kay and Davis (1990a 1990b) that added value ratios can provide more reliable and comparable assessments of business performance than can the more familiar ROCE measure. Further application and refinement of the thinking underlying added value is to

be found in Kay (1993, ch. 13). The critical practical issue, of course, is whether use of an added value ratio will lead to different judgments concerning the (absolute and relative) financial performance of firms. The present paper tries to throw light on this issue, by examining some of the properties of added value ratios and by looking at the extent to which they provide rankings of performance different from traditional ROCE for a sample of 355 UK companies during the period 1986–1991. The study is not attempting to determine whether added value ratios are theoretically superior to ROCE; it simply considers whether the ratios behave differently or not.

The remainder of the paper is organised as follows. The next section examines the arguments advanced by Kay and Davis in favour of added value ratios. Section three deals with sample selection criteria and the data. Results are presented in the fourth and fifth sections. Section six contains details of tests of sensitivity to changes in specifications of the models. Conclusions appear in the final section.

The return measures

For the purposes of this study ROCE is defined as:

$$\text{ROCE} = \frac{\text{profit before interest and taxes}}{\text{tangible capital employed}} \quad (1)$$

where profit includes non-trading income and share of associates' earnings, and tangible capital employed consists of share capital and reserves,

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¹Other proposals that have appeared in the literature include: replacing ROCE by a cash recovery ratio (Ijiri, 1980; Salamon, 1982); using time-series observations of ROCE weighted in an appropriate manner (Kay, 1976; Brief and Lawson, 1991); and computing a pseudo-internal rate of return from ROCEs (Brief and Lawson, 1992). All are forms of ROCE, in the sense of being ratios of earnings to capital (cash earnings to gross outlay in the case of the cash recovery ratio).

minority interests, short and long-term loans, and deferred tax and other long-term provisions, less capitalised intangibles. This is a widely-used definition of ROCE, as evidenced by the fact that it is the standard measure produced by DATAS-TREAM and Standard & Poor's Compustat Service. This ratio and minor variants appear in numerous textbooks on accounting and financial statement analysis.

Kay and Davis (1990a) advocate using a version of residual income, which they refer to as 'added value', suitably scaled for size. The resultant ratio we label 'added value on inputs employed' (AVIE):

$$\text{AVIE} = \frac{\text{added value}}{\text{input costs}} \quad (2)$$

Added value is defined by Kay and Davis as the excess of pre-tax operating profit over the cost of capital tied up in operating assets. The capital charge differs from conventional accounting practice in that it is not restricted to interest on debt capital; a charge is made covering certain operating assets (fixed assets and inventories), regardless of the sources of finance. Added value has a long pedigree as a performance measure in the management accounting literature, under the name of residual income.² The main difference between the added value concept developed by Kay and Davis and residual income as conventionally defined is the explicit focus in the former on operating activities. Added value is described by Kay and Davis (1990a) as an approximation of the economist's concept of surplus (or quasi-rent): it is an accountant's measure of the value created by the firm from the productive resources (labour and capital) at its disposal, over and above the benefits foregone from not deploying those resources elsewhere in the economy. Input costs are the amounts of wage and interest expense deducted from net revenue to arrive at added value. Net revenues is defined here as sales minus outlays on purchased inputs (including depreciation).³ Kay and Davis

point out that deflating added value by capital employed would have the drawback of penalising a capital-intensive firm twice (both in the numerator and in the denominator). AVIE is intended to be neutral in this regard.

A complete analysis of the relative merits of ROCE and AVIE requires: (i) full specification of the dimensions of business performance each measure is designed to capture and their relevance to the questions the users have in mind; (ii) empirical information on the extent to which the two measures behave differently; and (iii) estimates of their costs of production and use. Since our concern is with the statistical behaviour of the ratios, consideration of the other two aspects of the problem is restricted below to a few basic observations.

ROCE is a one-period accounting counterpart of the internal rate of return (IRR). As already noted, AVIE is an accounting analogue of the economist's concept of profit. IRR and economic profit are closely related constructs. Indeed, if ROCE were a totally reliable measure of IRR there would be little reason for considering AVIE, since ROCE would be sufficient for most purposes. However, accountants and economists have long been aware of ROCE's deficiencies as an expost measure of IRR (Harcourt, 1965; Solomon, 1966; Stauffer, 1971; Fisher and McGowan 1983; Brief, 1986). Indeed, the case Kay and Davis (1990a) advance for AVIE in preference to ROCE cites examples of where accounting measurement methods can result in ROCE yielding misleading comparisons between firms in different industries. For example, unlike retailers and manufacturers, software companies, advertising agencies and other 'people' businesses have few assets that are recognised in corporate balance sheets. These and similar structural differences between firms have the potential to distort both the numerator and the denominator of ROCE in ways that Kay and Davis try to allow for in AVIE by redefining profit to be net of all costs and scaling the result in a manner that allows for differences in capital intensity.

Unfortunately, AVIE is affected by accounting measurement biases, too. For example, the practice of immediately writing off research and development expenditures against income affects AVIE in much the same way as it does ROCE: the non-recognition of an asset in a prior period means no capital charge is made in arriving at

²See Solomons (1965) and Tomkins (1973) for conflicting views on residual income's suitability as a management control device. The possibility of residual income being used for external reporting has received comparatively little attention, an exception being Anthony (1983) who has been a long-standing advocate of its use for both financial and managerial accounting purposes, in both the business and non-business sectors.

³Kay and Davis's choice of the term added value is perhaps unfortunate in the sense that it is likely to be confused with the concept of value added that has appeared elsewhere in the accounting literature (e.g. ASSC, 1975; Morley, 1978) and forms the basis of disclosures provided by a number of UK companies. Value added is normally expressed as the amount generated during the year that is available for distribution to stakeholders (employees, lenders, shareholders and government) and for ploughing back into the business. It is usually computed by adding back wages and interest to pre-tax profit. Added value is therefore approximately equal to the difference between (i)

conventionally defined value added and (ii) the costs of labour (wages) and capital (debt interest and a notional charge for the use of equity finance). Conventional value added therefore approximates what Kay (1993, p. 211) refers to as 'net output'.

added value in the current one.⁴ Likewise, understatement of asset values caused by rigid adherence to historical cost biases both profit and added value in essentially the same way.⁵

ROCE provides a measure of operating performance that abstracts from capital structure effects. Kay and Davis take the logic of this one step further in AVIE, by including only the firm's operating assets in the base used to compute the capital charge. Operating assets are defined for this purpose as fixed assets and inventories. Whether such a firm distinction can safely be drawn between operating and financial activities is questionable. In particular, since the prices of a firm's outputs and inputs reflect the financing costs incurred by the firm and its suppliers in extending credit, consistency dictates that if trade creditors and debtors are excluded from the asset base then revenues and expenses should in principle both be adjusted to a prompt (i.e. cash) payment basis; otherwise net trade credit should be included in the operating asset base.⁶

Scaling added value by input costs is not entirely free of difficulty. In addition to the interest element being dependent on accountants' valuations of operating assets, there is the added problem of the introduction of a make-versus-buy bias: if a firm decides to make a component, wage and interest costs will be included in the denominator; if the firm buys in the component ready made, the numerator will be largely unchanged, but the denominator will exclude the wage and interest costs avoided by buying rather than making, without including anything in their place.

This difficulty is avoided in Kay (1993, ch. 13) by substituting net output for inputs employed as the scaling variable:

$$AVNO = \frac{\text{added value}}{\text{net output}} \quad (3)$$

Net output in (3) is equal to sales revenues minus

materials purchased (exclusive of depreciation),⁷ i.e., what would conventionally be referred to as value added. A pictorial representation of AVNO is given in Figure 1.

A cost advantage of ROCE is that all the data needed for its computation are provided in the published financial statements, whereas an estimate of the firm's cost of capital has to be provided from other sources to arrive at AVIE and AVNO.⁸ On the other hand, AVIE and AVNO are capable of direct interpretation in a way that ROCE is not, because added value is a measure of absolute performance. ROCE, on the other hand, is similar to the internal rate of return in the sense that the level is not capable of interpretation without reference to an external yardstick—the yield on another company or the cost of capital. In short, it is far from clear whether ROCE is more or less costly than the added value ratios, as far as the user is concerned.

Whether added value ratios provide better indicators of business performance than ROCE is hard to determine on a priori grounds alone. They certainly appear to be sufficiently different in concept and construction to suggest that they might provide different signals. On the other hand, each measure is derived from essentially the same data. Claims for the conceptual superiority of either added value ratios or ROCE therefore have to be treated with caution. The approach adopted here is to try to determine whether the two measures actually behave differently in practice.

Sample selection and data

The sample consists of all non-financial UK-registered companies with a full listing on the London International Stock Exchange throughout the calendar years 1986–1991 that meet the following data requirements:

- (i) an estimate of ROCE (together with the accounting data needed to compute the different added value ratios) available on DATA-STREAM each year; and

⁴Care has to be exercised here: the recognition of all intangibles will affect the definition of performance in a subtle but important way. All economic rents expected to be derived from superior managerial performance, monopoly position, etc., will be capitalised as assets, leaving ex-post residual income as simply the extent to which outcomes deviate from expectations. A distinction therefore has to be drawn between (a) intangible property rights representing resources which could be employed elsewhere and (b) pure goodwill. As Edwards et al. (1987, pp. 44–48) explain, only (a) should be included in the asset base if performance is to mean anything more than revision of expectations.

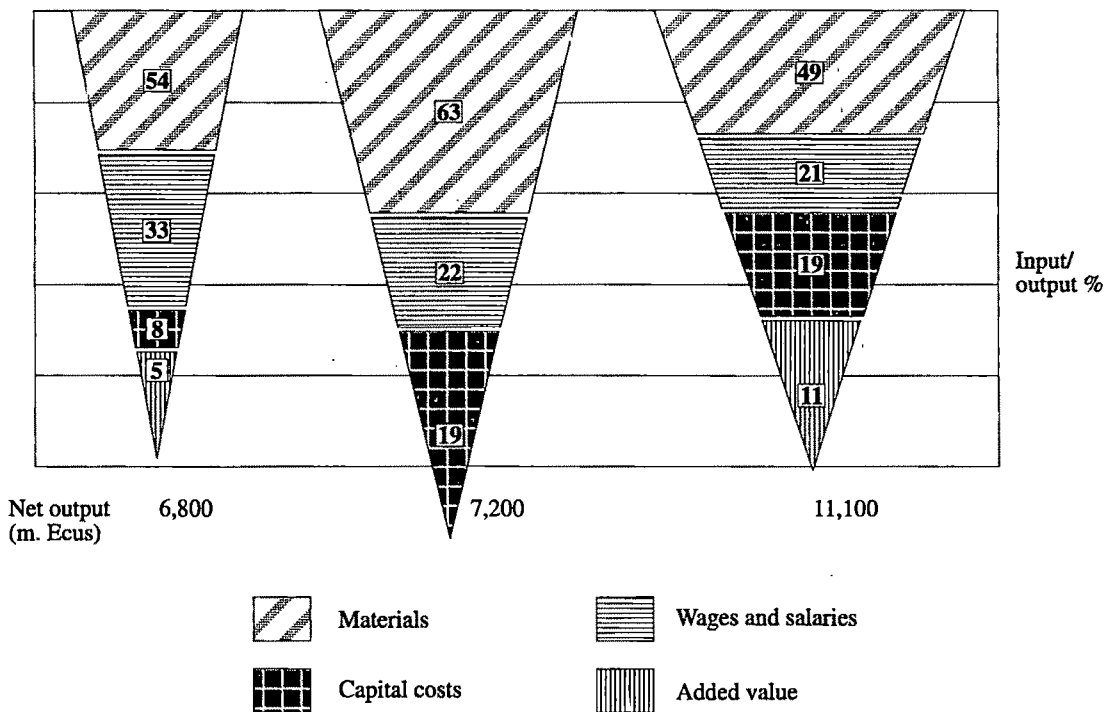
⁵An explanation of the role of current cost in the measurement of added value is presented in Kay (1993, pp. 197–202). See Bell (1986) and Edwards et al. (1987, ch. 3) for development of the case for using current costs in preference to historical costs in the computation of ROCE.

⁶As Grinyer and Elbadri (1989) show via a case study, measuring revenues and costs on an immediate payment basis can have a marked impact on operating profit.

⁷It is unclear from the text of Kay's book, but materials purchases appear to be defined in terms of the amount charged for materials in the profit and loss statement, i.e., exclusive of changes in inventory.

⁸This problem would not arise if profits were measured for external financial reporting purposes on a residual income basis. One way of doing this is to recognise interest on equity capital as well as debt finance, as Anthony (1973) advocates. Another is Grinyer's (1985, 1987) suggestion that interest be added each period to asset accounts, regardless of the sources of finance, the charge against income coming through in later periods in the form of higher amounts of depreciation and cost of goods sold. The likelihood of such proposals being readily adopted in practice would appear to be remote.

Figure 1
Pictorial Representation of Added Value¹



¹ Based on Fig. 18.3 in Kay (1993, p 295)

- (ii) an estimate of equity beta available in the London Business School's Risk Measurement Service for each year.

The choice of sampling procedure was dictated by two considerations: the desirability of holding constant the mix of companies through time in order to ensure that year-to-year variations in the measures are primarily the result of variations in underlying economic conditions; and the need to investigate the effects of allowing for risk in the computation of costs of capital (COC) by reference to a capital-asset pricing model. The resultant sample comprises 355 UK companies whose shares are traded on the market. Since the research design deliberately induces survivor bias, care must be exercised in generalising from the results of the study to the population of UK listed companies. However, the sample comprises a population in its own right, in that it includes virtually all the companies regularly tracked by investors and analysts. Differences in various accounting-based performance measures for such firms should be of considerable interest to users of financial statements.

For ease of reference, the different added value ratio measures examined in this study are sum-

marised in Table 1.

Further details are provided below. 'DSx' is shorthand for 'DATASTREAM item number x'. All the ratios are expressed in percentage form. The first ratio is the traditional ROCE measure:

(a) *ROCE*

$ROCE (DS707) = \frac{[\text{pre-tax profit} + \text{interest expense}]}{[\text{total capital employed} + \text{short-term borrowings} - \text{capitalised intangibles} - \text{future tax benefits}]}$

Two versions of the original Kay and Davis AVIE ratio are developed:

(b) *Constant-risk AVIE (AVIE(KD))*

The variables in equation (2) are defined in accordance with Kay and Davis (1990a) as follows: added value = operating profit (DS137) - capital charge; input costs = wages (DS117) + capital charge; capital charge = $COC \times [\text{fixed assets (DS339)} + \text{inventories (DS364)}]$. COC is fixed at 11.3% across firms and over time (see below).

The sensitivity of added value ratios to changes in specification is tested with the following versions

Table 1
Added Value Ratio Definitions

$$AVIE = \frac{\text{added value}}{\text{input costs}} \quad AVNO = \frac{\text{added value}}{\text{net output}}$$

where:

Added value	=	operating profit – capital charge
Input costs	=	wages + capital charge
Net output	=	operating profit + wages + depreciation
	=	sales – bought-in materials and services
Capital charge	=	(cost of capital) × (operating assets)
Operating assets	=	fixed assets + inventories

Cost of capital

AVIE (KD)	Fixed: 11.3%
AVIE	Varying: CAPM—determined with premium = 2%
AVNO	Varying: CAPM—determined with premium = 2%

of the model:

(c) *Risk-adjusted AVIE (AVIE)*

As per (b); except the COC is allowed to vary (see below).

The effect of changing the way added value is scaled is explored as follows;

(d) *Risk-adjusted AVNO (AVNO)*

The variables for equation (3) accord with Kay (1993) and are as per (c), except input costs is replaced by net output as the scaling variable: net output = sales – bought-in materials and services = operating profit (DS137) + wages (DS117) + depreciation (DS136).

Cost of capital is measured in two different ways in the different added value estimators. Following Kay and Davis (1990a), COC is held constant in the AVIE(KD) model. In the other added value models it varies in order to capture risk differences between firms. Differences in risk have been taken into account by means of the Sharpe-Lintner version of the Capital Asset Pricing Model (CAPM):

$$E(R_i) = R_f + \beta_i[E(R_m) - R_f] \quad (4)$$

where R_i , R_m and R_f are the returns on the i -th firm, the market portfolio and the riskless asset, respectively; $E(.)$ is the expectations operator; and $\beta_i = \text{Cov}(R_i, R_m) / \text{Var}(R_m)$ is the i -th firm's equity 'beta'. Since the purpose of the exercise is to compute the return required on the firm's assets — not its equity — beta must reflect only the riskiness of underlying operating activities. In other words, equity betas must be 'unlevered' in the conventional

textbook manner,⁹ by multiplying equity beta by the proportion of equity in the firm's capital structure.¹⁰ The alternative procedure of using accounting beta in place of unlevered market beta (Bowman, 1980) is not employed in this paper, because of the practical and conceptual differences involved.¹¹

The COC CAPM parameters have been esti-

⁹Strictly speaking, beta should reflect the ex-ante riskiness of operating assets only, excluding financial and other non-operating assets. To do this, it would be necessary to assign debt and equity between operating and non-operating assets in a non-arbitrary manner, which is not possible in practice.

¹⁰Systematic risk is affected by both operating (business) and financial risk. After adjusting for corporate taxes, Rubinstein (1973, p. 178) presents the relationship as follows:

$$\beta = \beta_o \left[1 + (1 - t) \frac{D}{E} \right], \text{ where } \beta \text{ is systematic risk, } \beta_o \text{ is operating}$$

risk, and t is the effective corporate tax rate. The effective tax rate is deemed to be significantly lower under the UK's imputation system of taxation (Stapleton and Burke, 1975), and to be of the order of 6% for perpetual debt with a full tax shield (Ashton, 1991). Therefore, as this 6% represents a ceiling for the tax advantage of debt capital, the results reported in this study assume that the tax advantage of debt is zero, i.e., where

$$\beta = \beta_o \left[1 + \frac{D}{E} \right]. \text{ Utilising a tax advantage of 6\% did not}$$

significantly alter the results and so is not reported here.

¹¹Accounting betas have to be derived from annual observations and as such are difficult to estimate reliably. Shevlin (1991, p. 6, footnote 4) speculated that this was the reason for the negative relationship he found between market and accounting betas, and which led him to opt for the former. Moreover, there is not an accounting equivalent of the CAPM that could be used in conflicts of this sort to incorporate accounting betas into an estimate of COC.

mated as follows:

- (i) The risk free rate (R_f) was set equal to the average of the monthly 91-day Treasury bill rate for each year, reported in *Financial Statistics Explanatory Handbook*.
- (ii) Betas were collected from the LBS Risk Measurement Service, with the June figures being used as the estimates for each particular year,¹² and 'unlevered' in the manner described above. The equity ratio was calculated from book values, as explained in (iii) below¹³.
- (iii) For the purpose of computing asset betas described in (ii) above, each equity beta was multiplied by the equity ratio. The equity ratio was defined as: [total share capital and reserves (DS307) + deferred tax (DS314)] ÷ [total loan capital (DS321) + short-term borrowings (DS388) + equity (DS307+DS314)].
- (iv) The estimate of the equity risk premium employed is 2% (Scott, 1992).

One procedure, adopted for the purpose of facilitating comparison with Kay and Davis (1990a), was to use their estimate of the long-term corporate borrowing rate (11.3%) in AVIE (KD).

Considerable controversy surrounds the descriptive validity of the CAPM; see, for example, Tinic and West (1984) and Fama and French (1992). Although other approaches such as Arbitrage Pricing Theory (APT) have been suggested (Ross, 1976; Roll and Ross, 1980) in place of the CAPM, examination of such issues falls outside the scope of the present paper. Our concern is simply with the impact of alternative ways of measuring COC on the different accounting-based performance measurements. While there are deficiencies manifested in the CAPM in general, the UK evidence concerning the descriptive validity of the APT is very mixed (Clare and Thomas, 1994; Cheng, 1995), so there would appear to be little to gain from using the APT rather than CAPM to incorporate cross-sectional differences in risk.¹⁴

¹²Since this is not an event study and different firms have different financial year-ends and announcement dates, it is meaningless to try to identify a particular point in time when calculating expected returns.

¹³Whether the unlevering process should be done with market rather than book values is unclear. Finance theory is based on market value, but Bowman (1980) finds that book value can sometimes be the better measure, especially for debt. In the light of the findings of Taggart (1977) and Marsh (1982) that results are likely to be insensitive to whether book or market data are used to calculate leverage ratios, refinements of this sort appear not to be warranted in the present study.

¹⁴Moreover, the CAPM is not inconsistent with the APT (Elton and Gruber, 1987). This, together with the lack of consistent empirical results for the APT, probably underlies the continuing use of CAPM betas in investment circles in practice.

Ratio patterns

Summary statistics on the cross-sectional patterns of ROCE and the AVIE and AVNO estimators over the six-year period are provided in Table 2. Mean ROCE was generally positive across all industries, varying from a low of 11.9% for the shipping and transport sector to a high of 36.3% for agencies, with a grand mean of 19%. As expected, the absolute amounts of ROCE bear little resemblance to the values of the AVIE and AVNO estimators.

Alternative ways of estimating the added value ratios affected the numbers in ways that can be summarised as follows:

AVIE(KD) is computed using an interest rate of 11.3%, whereas AVIE is derived using a COC rate that varies from company to company (industry means are shown in the final column of Table 2). COC has a major impact on both AVIE and AVNO, both in terms of general level and cross-sectional variation. However, it should be noted that there is little variation in COC at the industry level, so this cannot be the primary source of the inter-industry difference shown in Table 2. The different scaling methods change the numbers to a marked degree. This can be determined from comparing AVIE and AVNO.¹⁵

Economic theory suggests, in the absence of accounting measurement errors, that added value should tend to zero in 'normal' times. Variation in added value across industries is to be expected, of course, depending on the level of demand, the availability of supply, and the forces of competition. Large numbers of buyers and sellers are not necessary: contestable markets will suffice (Baumol et al., 1982). Persistently positive added values are suggestive of barriers to entry, and persistently negative ones of barriers to exit. The general level of economic activity can be expected to play a part, boom conditions generating positive added values, and a slump negative ones. The 1986–91 period covers both situations, so the figures reported in Table 2 can reasonably be regarded as 'average' in some medium-term sense. The added value ratio results point to monopolistic conditions more or less right across the economy, which is highly implausible, or to rapid economic growth, which is no less so. This issue is taken up again in the Sensitivity Analysis section, below.

Rank correlations between asset betas and the

¹⁵Too much weight should not be accorded to differences in estimators at the industry level, given that the results in the table are averages of numbers in ratio form. A consequence of this is that some of the paired estimators have different signs. If the comparison were at the individual firm level, this should happen only rarely, since each pair of matched estimates have in common the same added value measure and are each divided by what will usually be a non-negative number, but it can when averages are taken of differently scaled variables.

Table 2
Sample Means of Return on Capital Employed, Added Value Ratios and Cost of Capital Detailed in Table 1
for the Period 1986–1991 for Different Industries

	<i>N</i>	<i>ROCE</i> %	<i>AVIE (KD)</i> %	<i>AVIE</i> %	<i>AVNO</i> %	<i>COC</i> %
Building materials	24	19.2	15.2	10.8	6.3	13.26
Contracting and construction	13	18.4	11.0	4.5	30.6	13.32
Electricals	17	17.4	9.6	6.9	−0.4	13.17
Electronics	16	20.5	19.5	16.3	9.5	13.45
Mechanical engineering	22	18.5	6.5	3.8	−0.8	13.21
Metals and metal forming	22	15.4	6.9	4.2	1.2	13.21
Motors	18	15.0	7.2	4.4	2.3	12.99
Other industrial material	22	20.6	13.9	10.8	7.5	13.18
Breweries and distilleries	23	12.4	0.3	−5.1	−12.0	12.80
Food manufacturing	20	21.1	15.0	11.6	6.1	13.01
Food retailing	12	21.8	2.4	−1.3	32.4	12.98
Health and household products	9	25.1	26.6	22.0	13.3	13.21
Leisure	16	20.7	9.9	6.2	−1.8	12.99
Publishing and printing	11	23.8	−0.1	−1.8	34.5	13.01
Packaging and paper	8	18.1	10.1	7.1	5.3	13.16
Stores	13	20.8	18.7	13.3	5.7	13.24
Textiles	19	19.3	14.4	11.2	7.1	13.20
Agencies	6	36.3	37.7	34.6	21.5	13.06
Chemicals	17	22.3	21.4	17.5	9.9	13.16
Conglomerates	10	20.7	17.0	13.7	9.9	13.04
Shipping and transport	8	11.9	−3.7	−7.6	−9.6	12.71
Miscellaneous	22	17.9	8.1	5.7	73.5	13.13
Oil and gas	7	12.0	−16.5	−22.1	−25.9	13.03
Total sample	355	19.0	10.8	7.2	10.2	13.12

various added value ratios are reported in Table 3. If the risk adjustments were done correctly, there should be negligible correlation between beta and those added value measures where added value is computed on a risk-adjusted basis. On the other hand, since risk and reward are likely to be connected in the long run, beta should be positively correlated with ROCE and the version calculated with a fixed COC, namely, AVIE(KD).

The results reported in Table 3 provide some weak support for these conjectures. Beta is significantly positively correlated with ROCE, but the magnitude of the association is small, with the percentage of inter-firm variations in ROCE explained by differences in beta (obtained by squaring the rank correlation coefficients in Table 3) never exceeding 6% in any year.¹⁶ As expected, the associations between beta and the risk-adjusted added value measures, AVIE and AVNO, tend to

be smaller and weaker than those with ROCE and AVIE(KD), but the differences are slight. These results suggest that the choice of scaling variable is not driving the results.

Consideration needs to be given to the question of the statistical validity of assessments of performance measured in ratio form. One reason for dividing profit by capital employed in ROCE and added value either by inputs employed or net output is to control for the effect of size. Size is only properly controlled in these ratios if the numerator and denominator are strictly proportional (Whittington, 1980).¹⁷ Non-proportionality is one reason why financial ratios can exhibit skewness and other departures from normality, with resultant inferential difficulties for the analyst (Barnes, 1982, 1987; McLeay, 1991; Trigueiros, 1992). A number of studies have been made of these distributional properties of various accounting ratios. Most ratios, including ROCE, are non-normal to some degree (Deakin, 1976; Bougen and Drury,

¹⁶The reasons for the low correlations between beta and ROCE are hard to understand in terms of economic theory, since risk-bearing has to be compensated. It should be noted, however, that Penman (1991) reports similarly weak relationships between accounting return on equity and equity beta. One obvious possibility is the way accountants compute profit. Another is the method used to compute risk-adjusted required rates of return. In the long run, market rates of return and accounting rates of return must be related, but they can diverge markedly for considerable periods of time.

¹⁷Expressing added value as a proportion of input costs or net output, or indeed profit per unit of capital employed, might still be valid, if the resultant ratio were deemed to be of economic significance in its own right, regardless of whether strict proportionality holds. For example, the analyst might want to know the rates of return of different firms even when these are influenced by economies or dis-economies of scale.

Table 3
Annual Spearman Rank Correlations Between Asset Betas¹ (β s) and Return on Capital Employed and the Added Value Ratios, as detailed in Table 1, for 1986-1991 (t-statistics appear in parentheses)

	1986	1987	1988	1989	1990	1991
β and ROCE ²	0.243 (4.71)*	0.211 (4.06)*	0.224 (4.33)*	0.161 (3.06)*	0.120 (2.27)**	0.037 (0.70)
β and AVIE(KD)	0.220 (4.24)*	0.246 (4.77)*	0.174 (3.32)*	0.091 (1.72)**	0.036 (0.68)	0.102 (1.93)**
β and AVIE	0.167 (3.18)*	0.076 (1.43)	0.055 (1.03)	0.083 (1.56)	0.143 (2.71)*	0.226 (4.36)*
β and AVNO	0.139 (2.64)*	0.009 (0.17)	-0.001 (-0.02)	0.033 (0.62)	0.018 (0.34)	-0.070 (-1.32)

where:

* denotes significance at 0.01 level

** denotes significance at 0.05 level

¹Asset beta is the product of equity beta and one minus leverage

²The tests between beta and ROCE and AVIE(KD) are one-tailed tests, whereas the other tests are two-tailed tests

Table 4
Ratio Properties of Return on Capital Employed and Added Value Ratios. Skewness, Kurtosis and Bowman-Shelton Statistics. Parameters of Numerators on Denominators in the Ratios. Goldfield-Quandt Test Statistic. Observations are Means of the Time-series of Annual Data for the Period 1986-1991 for each firm (n=355) (t-statistics appear in parentheses)

ROCE model: $PROFIT_i = \alpha + \beta CAPITAL_i + \varepsilon_i$
 AVIE(KD) and AVIE models $ADVAL_i = \alpha + \beta INPUTS_i + \varepsilon_i$
 AVNO model $ADVAL_i = \alpha + \beta OUTPUTS_i + \varepsilon_i$

	Skewness	Kurtosis	Bowman-Shelton	$10^{-6}\alpha$	β	R ²	Goldfeld-Quandt
ROCE	0.689	14.44	1962.9	11.26 (2.96)	0.151 (60.29)	0.911	2106
AVIE(KD)	-1.442	16.90	2980.0	5.38 (1.39)	0.090 (11.14)	0.258	3663
AVIE	-1.529	16.81	2960.2	6.38 (1.51)	0.037 (4.38)	0.049	4459
AVNO	14.542	244.35	874147	5.23 (1.26)	0.036 (5.37)	0.073	4473

1980; Frecka and Hopwood, 1983; So, 1987; McLeay, 1987; Ezzamel et al., 1987). The evidence on proportionality is mixed (e.g., McDonald and Morris, 1984, 1985; Berry and Nix, 1991), but the assumption of strict proportionality is usually violated in the case of profit/capital ratios.

Unlike ROCE, the added value measures are not familiar accounting ratios and their stochastic

properties are not well understood. To present a 'representative' picture, covering both buoyant and depressed economic conditions, the mean of each ratio over the period 1986-1991 was computed for each firm. Summary data on the cross-sectional distributions of the time-series means of the ratios appear in Table 4.

The first three columns of the table provide es-

Table 5
Rank Correlations Between Return on Capital Employed and
Various Added Value Ratios Detailed in Table 1 for 1991

	<i>ROCE</i>	<i>AVIE(KD)</i>	<i>AVIE</i>
<i>AVIE(KD)</i>	0.896*		
<i>AVIE</i>	0.900*	0.997*	
<i>AVNO</i>	0.864*	0.957*	0.962*

where:

* indicates significance at 0.01 level

estimates of skewness, kurtosis and the Bowman-Shelton statistic, respectively, for each estimator. As expected, each of the four performance measures are non-normally distributed. ROCE, AVIE(KD) and AVIE are mildly skewed and have too many observations in the tails. AVNO is markedly positively skewed in the opposite direction to AVIE and much more 'spread out' than AVIE. Furthermore, the Bowman-Shelton statistics indicate that AVNO is non-normal to a far greater degree than is AVIE(KD), AVIE or ROCE. The price of using a deflator, net output, which avoids the conceptual difficulties identified with input costs, appears to be that the resultant added value ratio has to be treated more carefully by the analyst.

The most straightforward way of exploring the proportionality issue is in terms of the following linear model:

$$ADVAL_i = \alpha + \beta SIZE_i + \epsilon_i \quad (5)$$

Where $ADVAL_i$ is mean added value and $SIZE_i$ is either INPUT (mean input costs) or OUTPUT (mean net output) of the i -th firm during the period. Strict proportionality requires $\alpha = 0$. A non-zero intercept ($\alpha \neq 0$) can also induce skewness. Ordinary least-squares (OLS) estimates of the parameters in equation (5) are shown in Table 4, together with t statistics and corrected R^2 s.

Evidence concerning proportionality is somewhat mixed, with some (but not all) regression intercepts being statistically significantly different from zero at the 5% level. The regression results are very similar for AVIE and AVNO. The relationship therefore seems largely invariant to the way in which the asset base is measured.

Consideration needs to be given to the possibility that the error term in (5) varies systematically with the explanatory variable. OLS regression assumes that these errors are nuisance parameters that are independently and identically distributed (i.i.d.) random variables such that $\epsilon_i \sim \text{IN}(0, \sigma^2)$ for all i . The corresponding assumption in financial ratio analysis is that it is the ratio

of the two variables itself that should have this i.i.d. normal property. In which case, the error term in (5) has to be heteroscedastic with $\epsilon_i \sim \text{IN}(0, (\sigma \text{ SIZE}_i)^2)$, since if $\epsilon_i \sim \text{IN}(0, \sigma^2)$, scaling added value by size would introduce positive skewness into the ratio.

Insight into the extent to which the errors in (5) are heteroscedastic can be gleaned from the Goldfeld-Quandt test. This test has been carried out for ROCE, AVIE(KD) and AVIE. In each case, this was done by rank-ordering the 355 observations according to the magnitude of the explanatory variable, deleting the middle 20%, and running two separate regressions on the remainder (on the first and last 142 observations, respectively). For each model, the ratio of the residual sums of squares from the two regressions is reported in the final column of Table 4. Under the null hypothesis of homoscedasticity, this ratio has an F distribution with (140, 140) degrees of freedom. All the Goldfeld-Quandt statistics are significant at the 0.01 level, suggesting the presence of considerable heteroscedasticity in the regression residuals. This also indicates that the t values in Table 4 have to be treated with some caution.

Relative performance

Computation of an added value ratio is a slightly more burdensome exercise than ROCE, as the previous pages have revealed. Whether a financial analyst would be willing to exert the extra effort required will probably depend in large measure on the extent to which added value gives different answers. In particular, if the rank-order of firms is unaffected by choice of indicator, ROCE might suffice.

Rank correlations between ROCE and the different added value ratio estimators for 1991 are provided in Table 5. (Results were very similar in each of the other five years and so are not reported.) Correlations between the different added value ratios are also reported, for comparison purposes.

The picture is strikingly similar for the different added value measures. Correlations between the added value ratios and ROCE are all high, indicating that about three-quarters of the variance of one measure can be explained by the other in any year. The two types of financial ratio therefore appear to be capturing firms' economic attributes in ways such as to provide strikingly similar rankings.

How this result stands up to variations in the way in which the added value ratio is computed can be evaluated by considering the other correlations in Table 5. The various added value ratios are each slightly more correlated with each other than with ROCE. This finding supports the contention that added value is signalling something about firms that is different, in small degree, to that signalled by ROCE.

ROCE and the added value measures are clearly highly correlated in terms of rank orderings. There remains the issue of whether the relationship between the two measures is as close when allowance is made for numerical differences in the two types of performance measures. Insight into this issue can be gleaned from the pooled cross-section and time-series regressions of ROCE on the added value measures:

$$ROCE_{it} = \alpha_0 + \sum_{k=1}^5 \alpha_k D_k + \beta_0 AVIE_{it} + \sum_{k=1}^5 \beta_k D_{k+5} AVIE_{it} + e_{it} \quad (6a)$$

$$ROCE_{it} = \alpha_0 + \sum_{k=1}^5 \alpha_k D_k + \beta_0 AVNO_{it} + \sum_{k=1}^5 \beta_k D_{k+5} AVNO_{it} + e_{it} \quad (6b)$$

The dependent variable is the ROCE of the i -th firm in year t and the independent variable is a corresponding measure of AVIE or AVNO. Two sets of dummy variables are used to capture the model's sensitivity to conditions in particular years, each dummy taking on a value of 1 if the observation is from a given post-1986 year, and 0 otherwise. The first set, indexed $k=1 \dots 5$, are intended to pick up year-on-year variations in the intercept; α_0 provides an estimate of the intercept in 1986, $\alpha_0 + \alpha_1$ the intercept for 1987, $\alpha_0 + \alpha_2$ the one for 1988, and so on. The second set of dummies, indexed $k=6 \dots 10$, reflect year-on-year differences in the slope parameter. Thus β_0 measures the co-variation between ROCE and AVIE(KD), AVIE, or AVNO in 1986, $\beta_0 + \beta_1$ in 1987, $\beta_0 + \beta_2$ in 1988, etc. The final term on the right-hand side of (6), e_{it} , is the random error term, assumed to be i.i.d.

A separate OLS regression was run for each of the different added-value ratios. The parameters and associated significance and goodness-of-fit statistics for the two equations are reported in Table 6. The picture is dramatically different for AVIE and AVNO.

The residuals of these regressions are sufficiently 'well-behaved' to support the following conclusions. AVIE(KD) and AVIE each account for about half of the variation in ROCE. This relationship is weaker than that obtained by rank correlations, where we have seen that about three-quarters of the variation in ROCE is explained by AVIE(KD) or AVIE. The patterns of intercept and slope parameters are generally the same across the models, supporting the view that the relationship with ROCE is largely unaffected by varying the cost of capital. In both cases, the 1986 intercept (α_0) and slope (β_0) are highly significant. The changes in these two parameters over time relative to 1986 values is given by α_k and β_k , $k=1 \dots 5$. These changes are small in magnitude and generally insignificant from 1987 through 1989. The picture changes in 1990 and 1991, with the incremental change in the slope (β_4 and β_5) significant for both AVIE(KD) and AVIE.

There is much more evidence of inter-temporal instability in the AVNO regression relationship than was the case with AVIE. Moreover, the R^2 is 6%, which is far less than that obtained for AVIE, indicating that switching from inputs employed to net outputs to scale added value produces a ratio that behaves very differently from ROCE. However, difficulties with the data suggest that caution should be exercised in reaching this conclusion. First, $AVNO_{it}$ and $D_8 AVNO_{it}$ are each highly collinear with other variables in (6b), making for difficulties in arriving at reliable estimates. Second, there are a number of outliers that exert considerable influence on the regression. This later difficulty probably stems from net output being the difference between two (sometimes large) numbers, making for a potentially volatile scaling factor.

Because of extreme values of AVNO, the (6b) regression is re-run excluding all cases where AVNO is in excess of 300%. This screening procedure results in the loss of just 11 observations out of 2130, but the effect is marked.¹⁸ The multicollinearity problem disappears and R^2 trebles to 17%. This is still a lot less than the R^2 obtained when added value is scaled by inputs employed.

Regardless of how the added value ratio is defined, the picture that emerges from Table 6 is of a ratio that behaves differently from ROCE. This

¹⁸When (6a) is also re-run using the same screening procedure, only two observations are lost. Since the resultant parameter estimates, t values and goodness-of-fit measures are virtually identical to those shown in Table 6, details are not reported.

Table 6

Ordinary Least-squares Regressions of Return on Capital Employed on Different Added Value Ratios Detailed in Table 1. Observations are Pooled Cross-section and Time-series Annual Data (maximum no. observations = $355 \times 6 = 2130$) for the Period 1986-1991 (t-statistics in parentheses). D_k is a Dummy Variable Equal to 1 for a Specific Post-1986 Year and 0 Otherwise. Trimmed Sample Excludes Cases where AVNO Exceeds 300%

AVIE(KD) and AVIE models:

$$ROCE_{it} = \alpha_0 + \sum_{k=1}^5 \alpha_k D_k + \beta_0 AVIE_{it} + \sum_{k=1}^5 \beta_k D_{k+5} AVIE_{it} + e_{it}$$

AVNO model:

$$ROCE_{it} = \alpha_0 + \sum_{k=1}^5 \alpha_k D_k + \beta_0 AVNO_{it} + \sum_{k=1}^5 \beta_k D_{k+5} AVNO_{it} + e_{it}$$

<i>Regression parameter</i>	<i>AVIE(KD)</i>	<i>AVIE</i>	<i>AVNO (full sample)</i>	<i>AVNO (trimmed sample)</i>
α_0	0.156 (26.44)	0.161 (28.02)	0.185 (23.79)	0.180 (25.66)
α_1	-0.002 (-0.29)	-0.010 (-1.23)	0.009 (0.86)	0.198 (7.01)
α_2	-0.004 (-0.43)	-0.007 (-0.80)	0.031 (2.83)	0.004 (0.45)
α_3	-0.001 (-0.18)	0.019 (2.39)	0.013 (1.20)	0.034 (3.47)
α_4	-0.006 (-0.73)	0.025 (3.18)	0.007 (0.62)	0.012 (1.25)
α_5	-0.012 (-1.50)	-0.008 (-1.03)	-0.27 (-2.49)	0.013 (1.36)
β_0	0.318 (16.66)	0.324 (16.89)	0.083 (3.37)	0.004 (0.45)
β_1	0.038 (1.40)	0.030 (1.09)	-0.053 (-1.77)	-0.026 (-0.70)
β_2	0.035 (1.30)	0.038 (1.40)	-0.134 (-5.19)	-0.232 (-7.28)
β_3	0.003 (0.13)	0.024 (0.92)	-0.088 (-3.57)	0.189 (4.72)
β_4	0.080 (3.00)	0.104 (3.82)	-0.002 (-0.09)	-0.136 (-4.50)
β_5	0.056 (2.01)	0.060 (2.14)	-0.079 (-3.09)	0.037 (0.99)
R^2	0.50	0.51	0.06	0.17
F	193.5	201.7	12.9	40.3
DW	2.07	2.07	2.04	2.11
No.	2130	2130	2130	2119

is at odds with our findings based on the rank-ordering of the two ratios. The reason for this conflict would appear to be due to the existence of quantitative differences in the values of the measures that do not affect the relative orderings of firms.

Another way of assessing the relationship between the added value ratios and ROCE is in terms of forecasting power. Suppose future AVIE(KD) (or AVIE or AVNO) is deemed to be an attribute the user wishes to forecast. Will current ROCE provide as reliable an indication of

next year's AVIE(KD) (or AVIE or AVNO) as current AVIE(KD) (or AVIE or AVNO)? Conversely, is current AVIE(KD) (or AVIE or AVNO) as good a lead indicator of future ROCE as current ROCE? Some insight into this can be gleaned by computing time-series rank and product-moment correlations for the two types of measures. Since the patterns and levels of correlations are virtually the same for all the different ways of computing added value, results are presented for the two differently scaled versions of one arbitrarily chosen estimator. Serial rank cor-

relations for ROCE, AVIE and AVNO are reported in panel A of Table 7. Non-parametric serial cross-correlations between ROCE and AVIE and between ROCE and AVNO are given in panel B of the table. The same autocorrelation measures, computed on a parametric basis, appear in Table 8.

The results in panel A of Table 7 suggest there is little to choose between the three measures as instruments for predicting their own future rank orderings. Both AVIE and AVNO decline in predictive power at about the same rate as the prediction horizon lengthens. Likewise, a comparison of the pattern of cross-correlations between the j -th ($j=1986, 1987$, etc.) row and the j -th column for either matrix in panel B indicates that both AVIE and AVNO decline at about the same rate through time. Comparing the two panels, neither ROCE nor AVIE/AVNO displays markedly lower ability at predicting the other than it does at predicting itself. These results support the view that ROCE and the added value ratios contain a substantial amount of common information, in terms of the way they rank order different firms.

The parametric results in Table 8 are largely in accordance with the rank-order ones in Table 7, as far as the lead-indicator relationship between ROCE and AVIE is concerned. But the picture is very different for ROCE and AVNO. The half-matrices in panel A of Table 8 reveal that the serial correlations for AVNO fall away much more rapidly than do those for ROCE; and it is clear from panel B that both ROCE and AVNO are even worse as predictors of each other than they are of themselves.

Sensitivity analysis

A number of other models were tested to determine the effect of varying the computation of the added value ratios. These included the following:

- (i) Modifying operating assets to include net credit extended (net debtors), where net trade credit = trade debtors (DS287) - trade creditors (DS276).
- (ii) Setting equity beta equal to one, to allow for the tendency of betas to regress towards the mean (Blume, 1975).
- (iii) Using a market risk premium rate of 9%. Although Scott (1992) finds the market price of risk, $E(R_m) - R_f$, to be about 2%, the premium earned on equities has varied greatly over time (Siegel, 1992; Yaansah and Peasnell, 1994). However, it is commonly assumed to be of the order of 9% (Brealey and Myers, 1988).
- (iv) Setting COC equal to 17.7%, which is the estimate of the overall mean unlevered CAPM rate for all the firms in the sample, calculated using a premium of 9%.

The 15 resulting models are defined in Table 9. Results are not reported for space reasons, but the broad findings are summarised below.

The inclusion of net trade credit in operating assets reduced the overall level of the added value ratios. For instance, the AVIE sample mean given in Table 2 is 7.2% but the mean of the comparative added value ratio with net trade credit (AVIE(5)) is only 4.7%. However, this appears largely to be a levels effect: in relation to ROCE, the added value ratios that include net trade credit behave similarly to those computed exclusive of it. For example, the rank correlation between ROCE and AVIE(5) for 1991 is 0.911 compared to a rank correlation of 0.900 (see Table 5) between ROCE and AVIE. The results suggest that the inclusion of net trade credit does not significantly alter the rankings of the added value ratios.

The models where beta is fixed at one produce lower sample added value ratios. However, as was the case with net trade credit, this refinement does not make a significant difference to the rankings and the relationship with ROCE. For example, the rank correlation coefficient between ROCE and AVIE(7) is 0.898, which is almost identical to that between ROCE and AVIE (0.900).

The choice of risk premium has a substantial impact on the absolute levels of added value ratios. Raising the risk premium from 2% to 9% turns the added value ratios negative, changing a picture previously shown as indicative of monopoly or boom into one suggestive of excess supply and slump in many industries—which is not consistent with other economic indicators for the late 1980s.¹⁹ Alternatively, labour was able to extract wages above opportunity costs, at capital's expense—again, a conclusion that is hard to reconcile with other data available about developments in the economy during this period.

Further evidence of the impact of scaling on the distribution of the added value ratio is provided by two other sensitivity checks not mentioned in Table 9. Including depreciation in the input costs denominator of AVIE has only a marginal impact on skewness and kurtosis, but reduces the Bowman-Shelton statistics by about one-third. The impact of substituting sales for net output is considerable: skewness becomes markedly negative, kurtosis falls by about one-third and the Bowman-Shelton statistics by two-thirds. Clearly, choice of deflator has a large impact on the distribution of the added value ratios.

Insight of an analytical nature into the impact of the different scaling methods can be obtained by considering the relationship between AVIE and AVNO. Assume for this purpose that the defini-

¹⁹These results are not driven by the poor corporate results of 1991. When 1991 is excluded, average AVIE(1) is not so low, but it is still strongly negative.

Table 7
Time-series Rank Correlations Between Return on Capital Employed (ROCE) and both Added Value on Inputs Employed (AVIE) and Added Value on Net Output (AVNO) for 1986-1991. Details of AVIE and AVNO appear in Table 1

Panel A: Serial correlations

ROCE					AVIE				
1987	1988	1989	1990	1991	1987	1988	1989	1990	1991
0.799	0.682	0.671	0.829	0.804	0.799	0.703	0.844		
0.622	0.613	0.680	0.506	0.597	0.709	0.843			
0.571	0.454	0.506	0.597	0.798	0.593	0.640	0.791		
0.455					0.525	0.538	0.644	0.812	

AVNO				
1987	1988	1989	1990	1991
0.802	0.832			
0.685	0.695	0.773		
0.620	0.564	0.633	0.773	
0.544	0.512			
0.499				

Panel B: Serial cross-correlations

AVIE					AVNO				
1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
0.855	0.683	0.614	0.550	0.515	0.825	0.654	0.586	0.522	0.486
0.668	0.825	0.719	0.599	0.536	0.639	0.795	0.692	0.570	0.508
0.561	0.669	0.836	0.704	0.567	0.512	0.624	0.789	0.659	0.522
0.531	0.587	0.751	0.862	0.712	0.482	0.537	0.703	0.813	0.663
0.489	0.519	0.601	0.697	0.886	0.458	0.487	0.579	0.673	0.853
0.448	0.431	0.501	0.568	0.735	0.428	0.432	0.511	0.577	0.714

ROCE				
1986	1987	1988	1989	1990
0.412	0.395	0.423	0.542	0.740
0.395	0.423	0.542	0.740	0.900
0.412	0.515	0.536	0.735	
0.515	0.536	0.567		
0.536	0.567			
0.567				

Table 8
Time-series Product Moment Correlations Between Return on Capital Employed (ROCE) and both Added Value on Inputs Employed (AVIE) and Added Value on Net Output (AVNO) for 1986-1991. Details of AVIE and AVNO appear in Table 1

Panel A: Serial correlations

	ROCE					AVIE				
	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
ROCE										
1987	0.807					0.850				
1988	0.657	0.774				0.809	0.860			
1989	0.316	0.378	0.681			0.739	0.809	0.861		
1990	0.552	0.587	0.672	0.602		0.698	0.737	0.660	0.783	
1991	0.389	0.375	0.559	0.531	0.729	0.528	0.490	0.526	0.491	0.701

	1986	1987	1988	1989	1990
AVNO					
1987	0.901				
1988	0.443	0.415			
1989	0.604	0.754	0.671		
1990	-0.302	-0.494	-0.406	-0.825	
1991	-0.008	-0.016	-0.069	-0.125	0.135

Panel B: Serial cross-correlations

	ROCE					AVNO				
	1986	1987	1988	1989	1990	1986	1987	1988	1989	1990
AVIE										
1986	0.784	0.633	0.564	0.324	0.495	0.217	0.076	0.103	0.128	0.072
1987	0.692	0.766	0.654	0.382	0.532	0.087	0.103	0.111	0.114	0.003
1988	0.601	0.611	0.720	0.491	0.450	-0.234	-0.289	-0.351	-0.214	-0.059
1989	0.568	0.617	0.720	0.571	0.549	-0.163	-0.160	-0.153	-0.123	-0.164
1990	0.558	0.579	0.595	0.492	0.805	0.254	0.221	0.239	0.286	0.339
1991	0.409	0.340	0.393	0.391	0.580	0.079	0.095	0.120	0.126	0.033

Table 9

Operating Assets Bases and Cost of Capital Concepts Used to Compute the Capital Charge Component for the Added Value Ratios in the Sensitivity Analysis Section. Added Value Ratios Used in the Main Part of the Study are defined in Table 1

$AVIE = \frac{\text{added value}}{\text{input costs}}$		$AVNO = \frac{\text{added value}}{\text{net output}}$	
		Operating assets	Cost of capital
AVIE(KD1)		Fixed assets + inventories	17.7%
AVIE(1)	AVNO(1)	Fixed assets + inventories + debtors - creditors	Varying asset beta; 9% risk premium
AVIE(2)	AVNO(2)	Fixed assets + inventories + debtors - creditors	Varying gearing; equity beta = 1; 9% risk premium
AVIE(3)	AVNO(3)	Fixed assets + inventories	Varying asset beta; 9% risk premium
AVIE(4)	AVNO(4)	Fixed assets + inventories	Varying gearing; equity beta = 1; 9% risk premium
AVIE(5)	AVNO(5)	Fixed assets + inventories + debtors - creditors	varying asset beta; 2% risk premium
AVIE(6)	AVNO(6)	Fixed assets + inventories + debtors - creditors	Varying gearing; equity beta = 1; 2% risk premium
AVIE(7)	AVNO(7)	Fixed assets + inventories	Varying asset beta; 2% risk premium

tion of input costs given earlier in Table 1 is amended to include depreciation. With the other variables defined in that table, it is straightforward to show that AVIE is a non-linear function of AVNO of the form given in equation (7):

$$AVIE = \frac{AVNO}{1 - AVNO} \quad (7)$$

The relationship appears to be hyperbolic in form and undefined at both $AVNO = +1$ and $AVIE = 1$, suggesting that the values in the neighbourhoods of these two points are very different, depending on whether these limits are approached from above or below. However, in practice, AVNO cannot exceed unity (otherwise added value would be greater than net output, which is not possible, by construction). This upper bound on AVNO in turn implies from (7) that AVIE cannot be less than minus one. AVIE is therefore a positive increasing function of AVNO everywhere over this range (since the first and second derivatives are both positive).²⁰ The result is shown in Figure 2.

This analytical result throws light on our empiri-

cal findings concerning the effects of changing the way added value is scaled. There is a positive relationship between AVIE and AVNO throughout, but it is a non-linear one. The numerical differences can therefore be large for outliers—which explains why the picture differs depending on whether measures of association are expressed in parametric or rank-order form. Indeed, the positive relationship between AVIE and AVNO suggests that their rank correlations with ROCE should be identical. The difference must be due to Kay and Davis's exclusion of depreciation from their definition of inputs employed. Our results indicate that leaving out depreciation has only a small impact on the rank orderings.

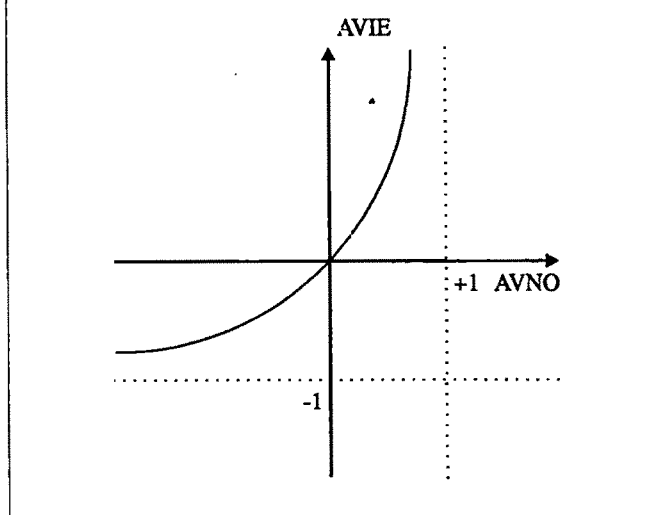
Summary and conclusion

The results reported in this paper can be summarised as follows:

- (i) As expected, beta is generally positively correlated with both ROCE and the constant-COC AVIE(KD) measure, but the magnitudes of the correlations are small throughout. The correlations diminish when a risk-adjusted measure of COC is used to compute added value.

$$\begin{aligned} \frac{\partial AVIE}{\partial AVNO} &= \frac{1}{(1 - AVNO)^2} > 0 \text{ and } \frac{\partial^2 AVIE}{\partial AVNO^2} = \\ &= \frac{2}{(1 - AVNO)^3} > 0 \text{ since } AVNO < 1. \end{aligned}$$

Figure 2
The Relationship Between Added Value on Inputs
Employed (AVIE) and Added Value on Net Output
(AVNO). Definitions appear in Table 1



- (ii) Like many other financial ratios, AVIE and AVNO do not follow a normal distribution. This is particularly true of AVNO, indicating that choice of scaling method has more effect than the way in which added value is computed. The evidence on proportionality is mixed: the relationship between added value and the scaling variable is largely invariant to the way in which the asset base is measured, variations in leverage and beta, and choice of deflator, but very sensitive to specification of the risk premium.
- (iii) ROCE, AVIE and AVNO generate very similar rankings of firms. The relationship is less strong when measured on a parametric basis, about half of the variance in one measure being accounted for by variation in the other, compared to two-thirds when the co-variation is estimated by reference to rank orderings. The regression results for AVIE exhibit considerable stability over the early years covered in this study, but much less so in 1990 and 1991. The corresponding regressions for AVNO are much less stable, being driven in part by outliers and contaminated by multicollinearity—a result consistent with the finding in (ii) above that scaling by net output affects the distributional properties of the ratio.
- (iv) AVIE/AVNO and ROCE are only marginally less successful at providing predictions of future rank orderings of each other as they are at predicting future rankings of themselves.

Absolute levels of AVIE and AVNO have to be treated with caution because the measure is sensi-

tive to choice of an appropriate interest rate, but the relative rankings generated by these two measures are different in some small degree to those provided by ROCE. The differences between the two types of measures, on the other hand, are much more marked when measured on a cardinal scale, i.e., when product-moment correlations are used in place of rank-order ones. Whether the differences are sufficient to justify the extra effort involved in adding AVIE or AVNO to the analyst's kit-bag of ratios must be a matter of judgment for the user. Theoretical considerations of the kind raised by Kay and Davis conjure up expectations of added-value ratios providing indications of relative performance of firms that diverge from those provided by ROCE to a far greater extent than appears to happen in practice.

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Contents

Log-Normality and Arbitrage Free Bounds on the Distribution Range of Zero-Coupon Pure Discount Bond Returns

by ARUN J. PRAKASH, MICHAEL W. SMYSER AND SHAHID S. HAMID

The Effect of After-Hours Announcements on the Intraday U-shaped Volume Pattern

by ALLEN B. ATKINS AND SOMNATH BASU

Decentralization, Management Accounting System (MAS) Information Characteristics and their Interaction Effects on Managerial Performance: A Singapore Study

by YEW MING CHIA

Stock Market Reaction to German Reunification

by JAHANGIR SULTAN

New Evidence on Predictability in World Equity Markets

by STEVEN J. COCHRAN AND ROBERT H. DEFINA

The Relation Between Predisclosure Information and the Dispersion of Financial Analysts' Forecasts of Earnings

by JANG Y. CHO AND CHARLES HARTER

A Test of the Control Hypothesis of Bond Creation

by AIGBE AKHIGBE AND T. HARIKUMAR

On the Inflation Risk Premium

by QUENTIN C. CHU, CHENG F. LEE AND DEBORAH N. PITTMAN

An Examination of Beta Estimation Using Daily Irish Data

by LOUIS MURRAY

The Bayesian Random Coefficient Market Model in Event Studies: The Case of Earnings Announcements

by BYUNGJUN AHN AND HYUN MO SUNG

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Market Perception of Goodwill: Some Empirical Evidence

Mark G. McCarthy and Douglas K. Schneider*

Abstract—Accounting and reporting for goodwill has been on the agenda of the Financial Accounting Standards Board, the International Accounting Standards Committee, the UK's Accounting Standards Board, and the US Congress. Goodwill has also been the subject of Securities Exchange Commission rulings directed at specific companies. The attention directed towards goodwill would suggest that it is a material asset for a large number of firms. This article analyses the market perception of goodwill as an asset in the determination of the firm's valuation. Also explored is whether the market values goodwill to the same degree as it values other assets. The results of this study found that the market perceives goodwill as an asset and incorporates the information in the valuation of a firm. The findings of this study could be of importance to those involved in and affected by standard-setting deliberations involving goodwill.

Introduction

Goodwill has been a source of controversy in the accounting profession since the early 1900s (Hughes, 1982), not only in the US, but internationally as well. The central issue appears to be whether goodwill should be recognised as an asset. If goodwill is presumed to be an asset, further controversy exists on whether goodwill should be amortised, and if so, how and over what period of time.

The increased attention focused on goodwill lately results from the merger and acquisition (M&A) activity of the 1980s, which produced a dramatic increase in the amount of goodwill on corporate balance sheets. For the fiscal year 1992, 1,451 US domiciled firms in the *Compustat*TM database reported total goodwill of \$158bn. This is a substantial increase on the 1988 figures of 1,106 firms reporting a total of \$89bn in goodwill. The objective of this study is to assess whether the market perceives goodwill as an asset, by examining US corporations that report goodwill on their balance sheets.

Current US Generally Accepted Accounting Principles (GAAP) for goodwill (Accounting Principles Board (APB) Opinion Nos. 16 and 17) require goodwill to be recognised when the purchase method is used to account for business combinations (AICPA, 1970). Goodwill is calculated as the excess of the purchase price over the fair market value of the acquired firm's tangible and identifi-

able intangible net assets. Goodwill is then amortised over its useful life, not to exceed 40 years. Firms desiring to minimise the annual amortisation expense on the income statement elect the maximum 40-year period.

Goodwill has been the subject of considerable attention by the Financial Accounting Standards Board (FASB). For instance, the FASB recently issued Statement of Financial Accounting Standard 121, *Accounting for the Impairment of Long-lived Assets and for Long-lived Assets to Be Disposed Of* (FASB, 1995). This statement requires that if a group of assets, which include goodwill, are impaired, the associated goodwill must be completely written off first, and then the associated assets should be reduced to their fair values. In 1991, the FASB issued a discussion memorandum, *New Basis Accounting*, which discusses carrying assets on the balance sheet at 'market values'. One question raised in the FASB discussion memorandum is how to assign a fair value to goodwill, since, unlike most assets, it cannot be separately exchanged for consideration (FASB, 1991).

The International Accounting Standards Committee (IASC) and the UK's Accounting Standards Board (ASB) have included goodwill on their agendas. The issue of goodwill recognition is especially contentious in the UK because the ASB may require firms to recognise goodwill on their balance sheets and then amortise it. The source of conflict is that the tradition in the UK is for acquiring firms to write off all goodwill immediately to a firm's equity. An alleged advantage of this approach to UK firms has been the favourable earnings impact of avoiding future amortisation expense.

The US Securities Exchange Commission (SEC) has also addressed goodwill. In 1991, it required several companies that had acquired high-tech

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businesses to accelerate their goodwill amortisation in order to report more conservative earnings (Mergers and Acquisitions, 1991).

The US Congress included goodwill in its legislation agenda. Congress recently passed a bill that allows a tax deduction for the amortisation of goodwill incurred since July, 1991. The increased cash flow emanating from the tax change could increase M&A activity and thereby increase the aggregate amount of goodwill on corporate balance sheets (Kimelman, 1993).

From the discussion above, it is evident that goodwill is an important and pervasive issue for the financial reporting community and other interested parties. The reason for the extensive attention focused on goodwill is materiality and widespread presence on corporate balance sheets.

Goodwill: a major asset

How prevalent is goodwill on US corporate balance sheets? A search of the *Compustat*TM database for fiscal year 1992 revealed 1,451 publicly-traded US firms reporting goodwill in the aggregate amount of \$158bn. Twenty-nine firms reported goodwill exceeding \$1bn. Table 1 shows selected examples of such firms, which include well-known companies such as RJR Nabisco, General Electric, Ford Motor and Eastman Kodak.

Goodwill is also a material percentage of total assets for many firms. Securities Exchange Commission Rule 5-02 of Regulation S-X requires disclosure of goodwill by commercial and industrial firms if it exceeds 5% of reported assets. For fiscal 1992 there were 874 of 1,451 firms (60.2%) reporting 'material' amounts of goodwill. Goodwill comprised more than 20% of total assets for 278 of the 1,451 firms (19.1%). In some cases, goodwill constituted a majority of a firm's assets. Table 2 shows

selected examples of US firms with goodwill in excess of 70% of reported assets.

While goodwill as a percentage of assets is in many cases quite impressive, an even more revealing approach to viewing goodwill is its relationship to a firm's stockholders' equity. In 1992, a total of 181 firms reported goodwill exceeding their equity, including 78 firms reporting negative equity. A total of 359 firms, including the 181 firms mentioned above, reported goodwill greater than half their equity.

The size of goodwill relative to equity has implications for the controversy of whether goodwill should be capitalised, an issue that is particularly contentious in the UK. For many goodwill-reporting firms in the US, goodwill is a significant contributor to debt/equity and debt/asset ratios. For our sample of fiscal year 1992 firms, an immediate write-off of goodwill would produce an 18.3% (11.8%) deterioration of the mean (median) debt/asset ratio. Due to the presence of firms with negative stockholders' equity in our sample, it would be difficult to calculate an average deterioration of the debt/equity ratio free of distortion, but the impact would no doubt be significant and in some cases severe.

Based on the above discussion, it is apparent that capitalisation of goodwill is an important financial reporting issue, and its recognition as an asset warrants empirical inquiry.

Related research

Goodwill has been the subject of many academic and practitioner works. Many of the earlier papers were analytical and descriptive in nature. However, in recent years a number of empirical studies have been published in the literature.

Gynther (1969), for example, states that the

Table 1
Selected Firms Reporting Goodwill in Excess of \$1bn (Fiscal Year Ended 1992)

<i>Company</i>	<i>Goodwill</i> <i>(US\$000,000s)</i>	<i>Total</i> <i>assets</i> <i>(US\$000,000s)</i>	<i>Goodwill</i> <i>assets</i> <i>(%)</i>
1. RJR Nabisco Hldgs Corp	13,062	32,041	40.8
2. Time Warner Inc	9,105	27,366	33.3
3. General Electric Co	7,714	192,876	4.0
4. Ford Motor Co	5,700	180,545	3.2
5. Dow Chemical	4,382	25,360	17.3
6. Eastman Kodak Co	4,273	23,138	18.5
7. Pepsico Inc	2,588	20,951	12.4
8. Black & Decker Corp	2,492	5,392	46.2
9. Baxter International Inc	2,167	9,155	23.7
10. Capital Cities/ABC Inc	2,047	6,522	31.4

Table 2
Selected Firms Reporting Goodwill in Excess of 70% of Total Assets (Fiscal Year Ended 1992)

<i>Company</i>	<i>Goodwill/ (US\$000s)</i>	<i>Total assets (US\$000s)</i>	<i>Goodwill/ assets (%)</i>
1. Coastland Corp of Florida	2,577	3,047	84.6
2. Robert Half Intl Inc	143,757	181,759	79.1
3. Resurgens Communications GP	95,501	126,909	75.3
4. Heritage Media Corp - CL A	367,625	496,296	74.1
5. Berlitz International Inc	335,682	454,269	73.9
6. Enquirer/Star Group - CL A	546,271	745,198	73.3
7. Incommet Inc	5,829	8,018	72.7
8. J2 Communications	5,345	7,598	70.3
9. Comdata Holdings Corp	304,506	433,732	70.2
10. Anntaylor Stores Corp	342,045	487,592	70.1

present treatment of purchased goodwill is incorrect because of adherence to the concept of 'excess profits'.

Miller (1973) concludes that no satisfactory solution to the goodwill problem exists. He states that the least harmful approach would be a write-off of goodwill immediately against income. Miller cites consistency, comparability and disclosure as a basis to support his argument.

Ma and Hopkins (1988) conclude that the problems surrounding goodwill are serious and pressing and that the search for a correct method of recording and amortising goodwill within the historical cost framework is not likely to succeed.

Colley and Volkan (1988) believe that the issue of capitalisation of goodwill will continue to be a source of controversy because changes in accounting standards for business combinations must invariably involve goodwill. They suggest that what is currently recognised as goodwill be separately identified and capitalised as specific intangible assets. Any unidentifiable portion of goodwill would be immediately written off to stockholders' equity on the acquisition date.

Brunovs and Kirsch (1991) present the three different accounting methods commonly used for goodwill. Their paper also discusses which method is required by various countries. Under one method goodwill can be capitalised and not amortised (e.g., New Zealand). A second method capitalises goodwill and then amortises it over some life usually between five and 40 years (e.g., the US). Finally, the third method charges goodwill immediately to a stockholders' equity account (e.g., the UK and Ireland).

Duvall, Jennings, Robinson and Thompson (1992) find evidence that suggests investors encounter difficulty in identifying the financial state-

ment impact of goodwill and its associated amortisation. In their study, graduate accounting students working in small groups were asked to estimate goodwill amortisation for publicly traded firms that did not disclose the amortisation amount in the financial statements. Based on the distribution of the estimation errors of the student groups, Duvall et al. conclude that more extensive and uniform goodwill disclosure requirements are needed for investors to 'unravel' the effect of current GAAP for goodwill.

Grinyer, Russell and Walker (1991) examine empirically management's choice of accounting for goodwill subsequent to acquisition. Purchased goodwill is regressed on price, leverage and a dummy variable signifying whether advantage of the merger relief is taken. Their findings are consistent with the trade-off hypothesis where the proportion of acquisition price assigned to goodwill is negatively related to post-acquisition leverage and the cost of the acquired firm, and positively related to the availability of merger relief reserves.

Hodgson, Okunev and Willett (1993) employ statistical transaction theory to analytically investigate several conceptual problems related to goodwill, including capitalisation and valuation. Based on their results, Hodgson et al. call for additional research on the measurement of goodwill.

Amir, Harris and Venuti (1993) employ several methods to test the value relevance of the information provided on Form 20-F to reconcile non-US GAAP earnings and stockholders' equity to US GAAP earnings and stockholders' equity. One of the components that causes the differences between non-US GAAP and GAAP is capitalised goodwill and amortisation. Amir et al. conduct an event study, which includes both long and short windows and its association with returns, and a

market-to-book ratio analysis and its association with price. Based on their overall findings from the market-to-book ratio analysis, they conclude that investors view capitalised goodwill as value-relevant, i.e., the reconciliation of accounting data to US GAAP increases the association between accounting measures and price.

Chauvin and Hirschey (1994) examine goodwill and its relationship with profitability and the market value of the firm. In one of their three models they include goodwill along with eight other independent variables. The dependent variable in the model is the market value of the firm. Using 2,693 firm observations that reported goodwill in the years 1989–1991, Chauvin and Hirschey find a significant and positive relationship between goodwill and a firm's market value. They conclude that it is sensible for accountants to recognise goodwill on a firm's balance sheet.

Jennings, Robinson, Thompson and Duvall (1995) employ a levels approach to examine whether investors use available information to assess the amounts and duration of cash flows associated with purchased goodwill for US firms for the period 1982 to 1987. They find in their balance sheet model a strong positive association between equity values and goodwill. In their income statement model they find a weak negative association between equity values and goodwill amortisation.

Muller (1995) examines the association of brand names, publishing titles and goodwill with firm value for UK firms that capitalised separately identifiable intangible assets. Employing a levels approach over the time period 1985–1994, Muller finds that reported amounts for brand names, publishing titles and goodwill provide investors with value-relevant information about UK companies.

One of two issues examined by Vincent (1994) is whether the market values goodwill differently from other asset write-ups that result from a business combination for US firms. Employing a levels approach, Vincent finds a positive and significant relationship between goodwill and the market value of the firm. Asset write-ups, however, do not yield a positive and significant relationship to the market value of the firm.

Finally, Barth and Clinch (1994) examine the effects of international accounting differences on firms' share prices and returns. Their testing included firms that were non-US registrants domiciled in the UK, Australia and Canada, and traded on US markets. Using regression, Barth and Clinch's findings for UK firms suggest that share prices act as if goodwill is an asset, but at a discount relative to other assets. In the regression model employing returns as the dependent variable, they find that the effects of differences between US and UK standards for goodwill and other intangibles are significant in explaining share returns.

The general theme in the theoretical and descriptive writings is that goodwill is currently being treated in an incorrect manner and an adequate solution may not be possible. Several recent studies have examined empirically the relationship between goodwill and the market value of a firm. Most of these works find a positive relationship between the reported goodwill of a firm and its market value. If goodwill is being reported 'incorrectly', then one would expect the market to put little value on goodwill. However, if the market uses current goodwill reporting to value a firm, then one might argue that goodwill recognition could be providing useful information to the market.

This study is different from recent work in this area in several ways. First, our study includes the most recent years of goodwill reporting for US companies. Second, it is comprehensive in terms of the universe of US firms reporting material amounts of goodwill. Third, it adopts Ohlson's (1989, 1993) model of including both balance sheet and income statement components to explain the market value of a firm.¹

Research issues

Goodwill is clearly present on the balance sheets of a large number of US firms. For some of those firms, goodwill represents a significant percentage of reported assets and stockholders' equity. The FASB is primarily concerned with providing financial statements with information that is useful to investors. Currently before the FASB, IASC and the UK's ASB are deliberations concerning the recognition and measurement of goodwill. The questions to ask and answer are, should goodwill be recognised, and if so, should it be measured similarly to identifiable intangibles, a closely related asset, and all other tangible assets?

Evidence that the market perceives goodwill as an asset when determining the value of a firm would provide some support for the proposition that goodwill should be recognised as an asset on the balance sheet. If goodwill is recognised as an asset, then another question is raised: is goodwill perceived similarly to other assets in the valuation of a firm? Addressing this question would provide insight into the relative importance of reported goodwill in valuing a firm compared to other assets. Should goodwill be found to be at least as important as other assets, then such results provide additional evidence for the recognition of

¹Jennings et al. (1995) examines the period 1982 through 1987 and employs two separate models, one using the balance sheet components to examine goodwill and a second using income statement components to examine amortisation. Muller (1995) adopts Ohlson's (1989, 1993) model but examines UK firms.

goodwill.

The above discussion prompts two research questions: first, does the market perceive goodwill as an asset when determining a firm's market value; second, does the market value goodwill similarly to identifiable intangible assets and to tangible assets?

Research design

The objective of this study is to test how the market perceives goodwill when assessing the value of a firm. The second objective is to test whether the market perceives goodwill in the same manner as other assets.

Several capital market-based research methods can be used to achieve these objectives. One approach is a returns/earnings study. This type of study would require data related to amortisation of goodwill, since it is through amortisation that goodwill affects earnings. However, data isolating amortisation of goodwill is not readily available on *Compustat*TM, and estimates would have to be generated. In addition, Duvall et al. (1992) found that firms do not adequately disclose goodwill amortisation in their financial statements.

Another capital markets approach is a risk or systematic risk study. However, in these studies a proxy must be used for both financial leverage and operating leverage, and results can vary significantly depending on the proxy chosen for operating leverage.

A third approach to capital markets research is to study the ratio of a share's price to its book value. Using this approach also leads to several limitations. First, firms with negative net worth must be eliminated. Second, 'outliers' are caused by firms with small book values. A third potential limitation with a price-to-book ratio study is that the dependent variable is a ratio and the distributional properties can be complex.

A levels approach, explained below, is selected for this study. Choosing a levels approach has several advantages over the methods discussed above. First, no estimates of the variables are required. Second, no firms have to be discarded or become potential outliers as the result of negative book values or small book values. All firms in a levels study will have positive market values. Also, coefficients from a levels regression can be interpreted as valuation weights, consistent with Ohlson (1993). Finally, an objective of this study is to test whether the market perceives goodwill in a manner similar to other assets. A levels approach permits this comparison. There are, however, several limitations to this research design, which will be discussed later in the paper.

The model employed in this study is developed as follows. Landsman (1986) uses balance sheet items to explain the market value of stockholders'

equity. If MA is the market value of a firm's assets and ML is the market value of a firm's liabilities, then under his approach the market value of stockholders' equity, ME, is given by:

$$ME = \beta_1 MA + \beta_2 ML + \mu' \quad (1)$$

where μ' is a residual term. According to Miller's (1977) model, the pricing mechanism would ensure that theoretically the coefficients of MA and ML are +1 and -1 respectively (Landsman, 1986).² Landsman uses the model in equation (1) to test the market's perception of firms' pension assets and liabilities.

The above model, however, considers only the balance sheet in trying to explain the market value of a firm. In a different study, Barth, Beaver and Landsman (1992) include only income statement items in their model. Their study tests the market valuation of pension costs reported in the income statement based on the following model:

$$ME = \beta_1 NI + v \quad (2)$$

where $\beta_1 = 1/r$ and r is a discount rate. Barth et al. separate the net income amount (NI) into sales, non-pension expenses and the different components of pension expenses.

According to Ohlson (1993) the market value of a firm's equity might be explained better by a model that includes both parts of financial accounting: a stock concept of value (book value) and a flow concept of value (earnings adjusted for dividends or 'clean surplus' Ohlson (1989)). Given Ohlson's theory the new model would be restated as:

$$ME = \beta_1 ASSET + \beta_2 LIAB + \beta_3 INC + \epsilon \quad (3)$$

where ME is as before, ASSET is book value of assets, LIAB is book value of liabilities and INC is the flow concept or income variable. With the introduction of a flow concept or income variable into the model, the theoretical values for the coefficients are different. According to Ohlson (1989, 1993) the coefficients will still add up to one, but there will be a weighted average between the balance sheet variables (ω) and the flow concept variable ($1-\omega$). In addition, there is a multiplier (θ) associated with the flow concept or income variable.

This study focuses on the market perception of goodwill reported by firms. Therefore, if assets, ASSET, are separated into assets which exclude goodwill, ALGW, and goodwill, GW, the ex-

²According to Miller's model '... in equilibrium, the market value of any firm must be independent of its capital structure', and 'But there would be no optimum debt ratio for any individual firm.' Given the theory that there is no optimal capital structure, Landsman (1986) developed the theoretical benchmark coefficients of +1 and -1 for assets and liabilities respectively.

panded version of the model becomes:

$$ME = \beta_1 ALGW + \beta_2 GW + \beta_3 LIAB + \beta_4 INC + \mu \quad (4)$$

Since the market value of firms' assets and liabilities are unobservable, book values of assets and liabilities are conventionally used as proxies for market values. ME is calculated by multiplying the number of common shares outstanding times the price per share of stock at the end of the fiscal year.³

Based on previous research, several values could serve as a proxy for income. Ohlson (1989) suggests that the flow variable should be 'clean surplus'. This is defined as the change in the net book value of the firm from the beginning to the end of the fiscal year plus cash dividends less new equity raisings. One approach to firm valuation sets the market price of a firm to the present value of future expected dividends. The information used in the prediction of future dividends is current earnings, book value and dividends, so that the market value depends only on these three information variables, of which clean surplus is a function.

Barth, Beaver and Landsman (1992) include net income for each firm as the independent variable and exclude the balance sheet variables. If the market value of a firm depends on the present value of expected future dividends, then at one extreme earnings will determine the market value since it is from earnings that dividends will be paid. Given their study and this model, another possible proxy for income valuation is simply the net income for the period. In addition, Ohlson (1993) shows how earnings and book values operate as the primary indicators of the value of a firm. Given these findings and theory, using net income as the income variable is also warranted.⁴

Finally, Ohlson (1993) also models the market value of a firm as a function of book value and (i) current profitability represented by abnormal earnings,⁵ and (ii) other information which modifies the prediction of future profitability. Based on Ohlson's model and assumptions, the difference between book value and market value depends on current abnormal earnings and their expected fu-

ture persistence. Given this model, a third proxy for income valuation is also examined using abnormal or unexpected net income. Unexpected net income is estimated using the simple random walk model, where the prior year's net income is used as the current year's expected earnings. Therefore, unexpected net income is the current year's net income less the prior year's net income.

Based on the previous research, there are alternative values to proxy for an income valuation when trying to explain a firm's market value. Therefore, regression model (4) is estimated three separate times, where each model includes one of the following in addition to the balance sheet variables: clean surplus, net income or unexpected net income. The model employing net income as the income variable is presented and discussed in the results section. The findings of the regression models using the two other variables for income are discussed in the Additional Analysis section at the end of the paper.

Hypotheses

In equation (4) above the coefficient of goodwill, β_2 , is the coefficient of main interest. If the market places value on the reported goodwill of a firm, then goodwill should be significant and positively correlated with the firm's market value. To check for this relationship the following null hypothesis is tested (**Hypothesis 1**):

$$H_1: \beta_2 = 0$$

Second, if goodwill is a significant variable, further examination should test how the market perceives goodwill in relation to all other assets. If goodwill is significant, is it priced differently from all other assets? This is tested with the following null hypothesis (**Hypothesis 2**):

$$H_2: \beta_1 = \beta_2$$

Data collection and sample selection

The data for this study was obtained from the *Compustat*TM database. This study examines firms incorporated in the US and reporting goodwill in the five year period, 1988 through 1992. The fiscal reporting year, number of firms reporting goodwill, and descriptive statistics are presented in Table 3.⁶ The *Compustat*TM variables required for the regression models, along with their mnemonic and item number, are presented in Table 4. Also included in the table are the variables used in the

³The regression models are also estimated using the market price of a share of stock three months after the end of the fiscal year. The results from these regressions are consistent with the findings presented in the paper.

⁴We did not expand the income variable into the components: sales, amortisation of goodwill and all other expenses. *Compustat*TM reports an amortisation number, but this represents the amount of expense for both goodwill and all other intangible assets. The only way to determine the amount of amortisation related to goodwill is to estimate its amount.

⁵Ohlson (1993) defines abnormal earnings as current earnings minus the risk-free rate, times the beginning of period book value, i.e., earnings minus a charge for the use of capital. This is sometimes referred to as residual income.

⁶To be included in the sample a firm had to report at least \$1,000 in goodwill and be incorporated (domiciled) in the US. US firms were identified by the *Compustat*TM variable Foreign Incorporation Code (FIC). Firms incorporated in the US have a 0 value for this variable.

regression models that are a combination of more than one *Compustat*TM variable.

Empirical procedures

In conducting this study, several econometric problems were encountered when estimating the regression equation. Three of them, heteroscedasticity, multicollinearity and measurement error are discussed below.

Heteroscedasticity arises from the fact that large firms usually have large regression errors and small firms usually have small errors. If heteroscedasticity is present, then the standard errors are

understated, resulting in overstated t-statistics. White (1980) develops a procedure to produce consistent estimates of the standard errors when heteroscedasticity is present. All regression standard errors, t-statistics and p-values are reported using White's procedure because significant heteroscedasticity is found to be present in 14 of the 15 models fitted.

The second potential problem in the regression model is multicollinearity. The estimates of regression coefficients are unbiased if multicollinearity is present, but there are several potential problems: (a) imprecision of estimation (high sampling variances); and (b) a high degree of sensitivity of the

Table 3
Descriptive Statistics for Sample Firms Reporting Goodwill

	<i>Mean</i> (US\$000s)	<i>Standard deviation</i> (US\$000s)	<i>Minimum</i> (US\$000s)	<i>Maximum</i> (US\$000s)
1988 (N = 1,106)				
ME	605,634	2,886,385	13	71,875,000
GW	80,617	352,574	5	7,787,000
ALGW	1,304,587	6,400,826	232	103,078,000
LIAB	1,063,729	5,628,365	40	92,399,000
INC	49,692	254,926	(465,762)	5,806,000
1989 (N = 1,172)				
ME	778,178	3,475,108	10	58,358,000
GW	109,437	623,956	5	13,965,000
ALGW	1,595,183	8,592,200	85	155,593,000
LIAB	1,345,635	7,685,235	87	138,165,000
INC	48,519	259,457	(1,149,000)	3,939,000
1990 (N = 1,227)				
ME	615,142	3,022,702	12	64,567,000
GW	100,280	482,820	3	9,073,000
ALGW	1,559,595	9,020,795	46	167,562,000
LIAB	1,316,861	8,054,806	71	150,424,000
INC	39,170	258,134	(966,000)	6,020,000
1991 (N = 1,260)				
ME	799,609	3,589,093	118	66,105,000
GW	111,278	598,490	2	13,250,000
ALGW	1,456,723	8,798,145	381	168,329,000
LIAB	1,219,333	7,828,971	123	154,039,000
INC	18,353	185,265	(2,827,000)	2,636,000
1992 (N = 1,451)				
ME	794,479	3,544,775	216	73,139,000
GW	108,752	563,870	1	13,062,000
ALGW	1,376,101	9,085,398	470	185,162,000
LIAB	1,174,544	8,405,906	45	169,417,000
INC	10,401	332,170	(7,384,990)	4,725,000
Variables	ME –	Market value of common stock		
	GW –	Book value of goodwill		
	ALGW –	Book value of assets less goodwill		
	LIAB –	Book value of liabilities		
	INC –	Income variable – net income		

Table 4
COMPUSTAT™ Variables Required for Regression Models

<i>COMPUSTAT™ variable</i>	<i>COMPUSTAT™ mnemonic</i>	<i>COMPUSTAT™ item no.</i>
Goodwill	GDWL	A204
Net income	NI	A172
Sales	SALE	A12
Total assets	AT	A6
Total liabilities	LT	A181
Closing year-end stock price	PRCCF	A199
Common shares outstanding	CSHO	A25
Cash dividends	DV	A127
Preferred stock liquidation value	PSTKL	A10
5-year least squares growth rate in sales	GSALE5	
5-year compound growth rate in sales	CSALE5	

Variables requiring more than one COMPUSTAT™ Item		
ME (market value of equity)	PRCCF×CSHO	
ALGW (assets less goodwill)	AT - GDWL	
LIAB (liabilities)	LT+PSTKL	
INC Unexpected net income - NI_t is current year net income and NI_{t-1} is the previous year net income	$NI_t - NI_{t-1}$	
Clean surplus - change in book value plus dividends	$(AT_t - (LT_t + PSTKL_t)) -$ $(AT_{t-1} - (LT_{t-1} + PSTKL_{t-1})) + DV_t$	

estimates of the coefficients to particular sets of sample data. If multicollinearity is present then there is potential for drawing misleading inferences from the t-statistics. Specifically, even though the t-statistics from the sample are unbiased (given that there are no other econometric problems), it is difficult to determine if the sampling variances are large because of multicollinearity, or whether the variance of the true population is large.

The third potential problem in the regression model is measurement error in the regressors. The use of book values for assets and liabilities instead of market values is employed because the market values of these items are unobservable. The use of book value may affect the interpretation of results. However, without knowledge of the specific form of measurement error (systematic or random) and the covariance structure of the measurement error of the explanatory variables, it is difficult to predict what bias—if any—to expect in the estimates of the regression coefficients.

Results

One of the problems encountered in the regression model is multicollinearity. Table 5 presents the Pearson correlation coefficients for all the independent variables.⁷ As expected, there is a very high correlation between total assets less goodwill (ALGW), and total liabilities (LIAB). The smallest value, 0.98084, is found in 1988. The correlations among the other independent variables are also quite high.⁸

⁷The correlations related to the INC variable in Table 5 are based on the net income variable.

⁸Two other diagnostics for detecting multicollinearity are also examined. In all years, the variance inflation factors for ALGW and LIAB are well above the benchmark value of 10 signifying the presence of multicollinearity (Neter, Wasserman and Kutner, 1985). The condition index was also considered. These values ranged between 18 in 1988 and 1989 to 35 in 1990. All years are above the 5–10 range, which is considered weak dependencies (Belsley, Kuh and Welsch, 1980).

The first hypothesis tests if goodwill is significant in explaining the value of a firm. In this testing GW is included in the regression model as a separate independent variable in addition to ALGW, LIAB and INC. If GW is significant in the model this would provide evidence that reported goodwill is perceived by the market to have value.

Table 6 presents the results of the regressions when net income is included as the flow concept or income variable. The adjusted R-square values for these models range from 0.8253 in 1989 to 0.9449 in 1988.

Goodwill is positive and significant at the 0.0001 level in all years yielding a rejection of Hypothesis 1. This finding suggests that investors perceive goodwill as an asset when valuing a firm. This is consistent with the findings of Jennings et al. (1995).

Another result from Table 6 that needs addressing is the temporal instability of the regression coefficients over the five-year period. In the Ohlson (1993) models the coefficients are a weighted average of the stock variables, assets and liabilities, and the flow variable, clean surplus. The sum of

the coefficients is still 1, with the book value and flow coefficients being weighted δ and $(1-\delta)$ respectively. Easton and Harris (1991) base their model of explaining stock returns on Ohlson (1993). In their results over the years 1968 to 1986, coefficients for the stock variable (book value) and flow variable (earnings) were not stable from year to year, suggesting that δ is not stable over time.

The same finding is evident in Table 6. The coefficient for net income ranges from 3.343 in 1992 to 9.727 in 1990. For the stock variables, the absolute value of the coefficients for other assets range from 0.164 and insignificant in 1990 to 2.095 in 1992 and for liabilities from 0.171 and insignificant in 1990 to 2.152 in 1991. In addition, the absolute value of the estimated regression coefficients for all the balance sheet variables for the years 1991 and 1992 are greater than two. This variation in estimated regression coefficients may also be a result of the multicollinearity of the independent variables (Neter, Wasserman and Kutner, 1985).

Based on the results of the regression model it appears that goodwill is included by investors when valuing a firm. This is supported by the

Table 5
Pearson Correlation Coefficients by Year

	<i>ALGW</i>	<i>LIAB</i>	<i>INC</i>
1988			
GW	0.57127	0.57703	0.49965
ALGW		0.98084	0.64456
LIAB			0.50627
1989			
GW	0.45483	0.50367	0.31234
ALGW		0.98756	0.70861
LIAB			0.61884
1990			
GW	0.57429	0.59518	0.39288
ALGW		0.98950	0.57732
LIAB			0.47549
1991			
GW	0.50024	0.53457	0.17031
ALGW		0.99193	0.05548
LIAB			0.07537
1992			
GW	0.47063	0.49215	0.04270
ALGW		0.99438	-0.17850
LIAB			-0.18826

Variables: GW - Book value of goodwill
 ALGW - Book value of assets less goodwill
 LIAB - Book value of liabilities
 INC - Income variable - net income

Table 6
Summary Statistics for Regression Model

$$ME_i = \beta_0 + \beta_1 ALGW_i + \beta_2 GW_i + \beta_3 LIAB_i + \beta_4 INC_i + \mu_i$$

<i>Year</i>	<i>Variable</i>	<i>Parameter estimate</i>	<i>White std error</i>	<i>White t</i>	<i>p-value</i>	<i>Adj. R² (N)</i>
1988						0.9449 (1,106)
	INTERCEPT	20.942	23.076	0.907	0.3642	
	ALGW	1.134	0.206	5.495	0.0001	
	GW	1.636	0.330	5.109	0.0001	
	LIAB	-1.166	0.207	-5.626	0.0001	
	INC	4.312	1.293	3.334	0.0001	
1989						0.8253 (1,172)
	INTERCEPT	79.370	53.382	1.486	0.1374	
	ALGW	0.923	0.212	4.338	0.0001	
	GW	2.637	0.521	5.061	0.0001	
	LIAB	-1.006	0.228	-4.398	0.0001	
	INC	6.024	2.326	2.589	0.0096	
1990						0.9202 (1,227)
	INTERCEPT	114.945	21.198	5.422	0.0001	
	ALGW	0.164	0.171	0.961	0.3362	
	GW	0.881	0.248	3.544	0.0001	
	LIAB	-0.171	0.172	-0.992	0.3214	
	INC	9.727	1.413	6.880	0.0001	
1991						0.8403 (1,260)
	INTERCEPT	20.921	46.647	0.448	0.6538	
	ALGW	2.080	0.177	11.719	0.0001	
	GW	2.134	0.386	5.515	0.0001	
	LIAB	-2.152	0.195	-11.015	0.0001	
	INC	7.384	1.509	4.893	0.0001	
1992						0.8448 (1,451)
	INTERCEPT	47.375	44.777	1.058	0.2902	
	ALGW	2.095	0.356	5.879	0.0001	
	GW	2.181	0.484	4.500	0.0001	
	LIAB	-2.051	0.390	-5.253	0.0001	
	INC	3.343	0.908	3.678	0.0001	
Variables:	ME -	Market value of common stock				
	GW -	Book value of goodwill				
	ALGW -	Book value of assets less goodwill				
	LIAB -	Book value of liabilities				
	INC -	Income variable - net income				

significance of the goodwill variable across all five years.

Given that goodwill is significant in valuing a company, the second hypothesis examines the magnitude of the market perception. How is goodwill perceived in relation to all other assets? The hypothesis is tested by comparing the coefficients of goodwill and other assets. If the coefficients are significantly different, then the market perceives

reported goodwill different from the other assets. If the two coefficients are not statistically different, then this would suggest the market treats goodwill like other assets.

The results of this test are in Table 7. First, the estimated coefficient for goodwill is greater than other assets in all five years. The null hypothesis of equal coefficients can be rejected in only two of the five years tested, 1989 and 1990, at the 0.05

Table 7
Test Statistics by Year for Hypothesis: $\beta_1 = \beta_2$

Year	Coefficients		Chi-square	p-value
	GW	ALGW		
1988	1.636	1.134	3.6871	0.0548
1989	2.637	0.923	13.5795	0.0002
1990	0.881	0.164	24.6443	0.0001
1991	2.134	2.080	0.0165	0.8975
1992	2.181	2.095	0.0277	0.8678

ALGW – Book value of assets less goodwill

MGW – Book value of goodwill

level. However, the p-value for 1988 is very close to rejecting the null hypothesis at 0.0548.⁹

Given that the results are not consistent over the entire five-year period and that the coefficient estimates in some of the years are considerably different from ± 1 , caution must be exercised when interpreting these mixed results. Even though the coefficient for goodwill is higher than the coefficient for all other assets in all five years and significantly higher in two of the five years, it cannot be generally concluded that the market perceives goodwill as having a higher value than other assets because of the mixed results presented in Table 7. One statistical problem with this study is the use of book values to proxy for market values. The market value of goodwill is unknown. However, the other variable, ALGW, representing the remaining assets, has some components where market value is equal to book value, such as cash and accounts receivable, and some components where the market value may be greater than book value, such as inventory and property, plant and equipment. This most likely will result in measurement error. The extent of influence measurement error has on the results is unknown. Therefore, a more conservative interpretation of this finding is that goodwill appears to be perceived by the market with a value at least equal to other assets and possibly greater.

Additional analysis

To explore the robustness of our findings, the model is estimated using several alternative speci-

fications. The results of these additional regressions are discussed below.

First, the model is estimated in two different reduced forms. The first of these models nets the variables assets less goodwill (ALGW) and total liabilities (LIAB). By netting ALGW and LIAB, the variables that are highly correlated and the cause of multicollinearity in regression model (4) are reduced to one variable. The results from this regression related to goodwill are consistent with the previous findings. In addition, the diagnostics used to detect multicollinearity provide results suggesting that it is not a problem with this reduced model.

A second reduced model includes only the balance sheet variables in the regression equation, as in Landsman (1986). Consistent with the previous results, goodwill is positive and significant in every year. In this reduced model, the estimated coefficient for GW is greater than the estimated coefficient for ALGW in all five years. Another result of interest from this reduced model is the increased stability of the coefficients over the five-year period. Since the income variable is eliminated from the model, there is no longer a weighted average between the income variable and the balance sheet variable.

Third, all the models, full and reduced, are estimated in a deflated form. The method of deflation is based on Park (1966), using sales as the deflator.¹⁰ Again, the results from these regressions are consistent with the previous findings.

Fourth, the model is estimated with each of the other income variables, clean surplus and unexpected net income. The overall results for these models are consistent with those in Table 6. The only differences in the results are that in 1991 both models produced a coefficient for goodwill that is

⁹Barth and Clinch (1994) find a coefficient for goodwill with a discount compared to the coefficient to all other assets. Jennings et al. (1995) have mixed findings on the magnitude of goodwill to other assets. In their time series model, the coefficient of goodwill exceeded that of other assets. However, when a fixed effect model is employed, the results suggest that goodwill is discounted by investors relative to other assets.

¹⁰This is the same method of deflation used by Landsman (1986).

less than the coefficient for all other assets. Also, these two models have slightly less explanatory power.

Finally, one concern in the study is that self-selection bias could be driving the results. Since firms that acquire other firms are most likely growing, there is a possibility that the goodwill produced from these acquisitions proxies for growth options. To test if goodwill is indeed a proxy for growth, equation (4) is estimated again for all five years with an additional variable to represent growth. Several different variables are used as growth proxies, including five-year compound growth rate of sales, five-year least squares growth rate of sales, average growth in dollars of sales over the previous five years, and average growth in dollars of total assets over the previous five years.¹¹ Including a growth variable in the regression does not change the results relating to the goodwill variable.

Conclusion

The purpose of this study was to look for empirical evidence of how goodwill is treated by the market in valuing a firm. The results suggest that the market includes goodwill when valuing a company, but there are several potential limitations with the study.

The first is heteroscedasticity. To alleviate this concern, White's (1980) standard errors were used to determine the t-statistic and p-value. The second potential limitation is multicollinearity. In the presence of multicollinearity there could be a problem in drawing misleading inferences from sample t-statistics. However, the model was estimated in a net form, which alleviated the multicollinearity problem. The results obtained from the net model were consistent with the full model. Third, there is a concern about measurement error. The market value of both assets and liabilities is unobservable. Finally, no doubt our sample firms reflect self-selection bias. Firms that report goodwill on their balance sheet are not a random sample. Therefore, given these limitations, caution must be exercised when interpreting the results.

If, however, the findings of the study are taken at face value, then it appears that the market does place a value on goodwill when evaluating a US firm. The first finding in this study shows that the market tends to view goodwill as an asset when valuing a company. This result is consistent

throughout several different models, both full and reduced. The second major finding was that, relative to their book values, goodwill is valued by the market at least as much as other assets.

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¹¹Five-year compound growth rate of sales is an average growth that calculates the rate of movement between the first observation and the last observation and then compounds this rate over five years. Any observation between these two points is not taken into consideration. Five-year least squares growth rate of sales is the average annual growth rate that takes into consideration each observation of the five-year period. This growth rate calculates the line of best fit for all observations.

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BRITISH ACCOUNTING REVIEW

Volume 27 Number 1 March 1995

CONTENTS

British Accounting Association

In Memoriam

Analytical properties of earned economic income
By K. V. PEASNELL

Market reaction of analysts' multi-year forecast revisions: a non-parametric approach
By YU-HON LUI

Questioning the assumed homogeneity of the behavioural environment of accounting firms:
some exploratory empirical evidence
By TIMOTHY J. FOGARTY

British companies legislation and social and political evolution during the nineteenth century
By STEWART JONES and MAX AIKIN

Announcements

Book Reviews

Comparative International Accounting, Fourth Edition. *C. W. Nobes and R. H. Parker.* Prentice Hall, 1995. 494 pp. £19.95.

Those who teach international accounting need no introduction to this book which is the well-established market leader in the UK and is known as a standard text wherever else in the world international accounting is taught. A particular characteristic of the book is that it approaches international accounting through comparative country studies. Most international accounting textbooks as such, leaving aside comparative reference books such as Alexander and Archer (1995) or Walton (1995), put the emphasis on technical issues for multinationals and harmonisation, with comparative country material given only a minor (usually superficial and often not very accurate) treatment. Most of these textbooks are written by American authors and are oriented around the approach to international accounting most commonly used in US universities (see Conover, Salter and Price, 1994).

However, given that accounting is a construct heavily influenced by the culture and circumstances of individual countries, it is difficult to see how one can teach comparative accounting successfully through an analysis based solely on technical issues. It seems more logical that the approach should be on the basis of the individual country because the student can develop an idea of the country's approach set within a cultural framework and is much better able to understand the nature of the accounting. This seems much more satisfying than a sort of Cook's tour of accounting oddities, which may leave the student with the idea that all other countries have unintelligible and incoherent accounting rules.

At a recent meeting of the international section of the American Accounting Association (AAA), where teaching international accounting was the focus, it was clear from presentations made by US accounting firms and companies that international employers are now beginning to come round to this point of view. The speakers stressed the importance of students being given an understanding of the existence of and coherence of other business cultures so that they could work more easily in an international environment.

The first edition of this book, published in 1981, broke new ground by setting itself firmly in a country-based approach (but including some chap-

ters dealing with technical matters for multinationals, such as foreign currency translation) and it became the established British text on international accounting. Subsequent editions have not simply been an update of the first edition — the coverage has continued to evolve. The second edition, coming out in 1985, broadened the country coverage to include Japan, while also adding foreign exchange risk management and classification of corporate income taxes.

The third edition (1991) involved a fairly substantial step up in size, taking in some material from Nobes and Parker (1988) which had addressed the multinational more directly. That edition brought in chapters on accounting regulation in Anglo-Saxon countries, segmental reporting, international financial analysis, transfer pricing and an analysis of the nature and growth of multinationals. The new fourth edition continues the tradition of change, introducing a chapter on international audit and a brief introduction to 'Asian tigers' (accounting in Hong Kong, South Korea, Taiwan and Singapore). At the same time the chapters on transfer pricing, foreign exchange risk management and accounting in developing countries have been deleted.

A further innovation in this edition is the publication of a loose-leaf teacher's manual. This consists of suggested questions, outline answers, OHP slide versions of tables from the text, and extracts from five sets of sample accounts which are referred to in some of the questions. The questions consist of one set of mostly essay questions relating to individual chapters, followed by outline answers. There is also a short section with 42 multiple choice questions. While, as the authors point out, teachers are likely to want to provide their own current examples of actual company accounts, there is a great deal of material in this manual which will make the teacher's life easier, and particularly the teacher for whom international accounting is a relatively new area.

If one were to fault the book, one might suggest that while the outlook is international and the viewpoints are not narrowly British, it still feels very much an Anglo-Saxon approach. I much appreciated the cover illustration which is a world map, not focusing on the Atlantic, but instead on the Pacific—and with Australasia as the centre of the world. I would also suggest that too many country writers pay too little attention to accounting diversity within each country—harmonisation,

or rather the lack of it, should be considered as a national issue as well as an international one, as is perhaps evident from small GAAP/large GAAP debates.

The book is generally well-written and the material clearly presented, as one would hope with editors who are individually good writers and presenters, and who have in any event written or co-written just over half the chapters. The updating has been very thorough and the useful end of chapter lists of references and further reading accurately reflect the evolution of the literature since the third edition. The fourth edition is a welcome progression from the earlier editions and will maintain the book in its position as a market leader. The great upsurge of interest in international accounting in the last few years has led to a dramatic increase in the quality and quantity of material being published. I am sure we will see challengers to this book's leadership, but it will be difficult to beat.

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European Financial Reporting Series. Italy. *Angelo Riccaboni and Rosanna Ghirri*. Routledge for ICAEW, 1994. xxii+272 pp. £65.

One of the major and recurring problems when approaching international accounting is the lack of detailed information about different national practices. However, the difficulties in conveying a comprehensive picture of an 'accounting context' are also widely recognised, which is especially true for such an idiosyncratic situation as Italy's.

The volume by Riccaboni and Ghirri illustrates for the first time in a comprehensive way the Italian financial reporting environment, with particular reference to its more technical and regulatory aspects. Moreover, some pages devoted to the origins of double-entry bookkeeping and the most pre-eminent Italian schools of thought are there to underline the long-standing tradition of this commercial practice in Italy and the commonly attributed importance of the scholarly thinking for its development in the last two centuries.

The book is divided into three major parts. The first deals with the country's business environment,

presenting some recent information and data on the general economic situation, the legal forms of business organisation, the structure of the financial system (in particular, of the banking system and the stock exchange), and the unusually complicated tax regulations. All these elements are useful to set the economic and legal scene on which accounting actions take place, and to get acquainted with some of the specificities of the Italian context.

The second part describes extensively the features of Italian financial reporting, introducing the reader to the intellectual debate on accounting and *Economia Aziendale* (business administration), the regulation on individual company accounts, the role of accounting standards, the rules on group accounts, and—last but not least—the audit and accountancy profession. As pointed out elsewhere, in the last few years Italy has undergone a sort of regulatory revolution, partly as a consequence of the implementation of EC Directives. This section, which is the core of the book, gives an elaborate technical description of the new legal environment. In particular, the accuracy and user friendliness of the presentation of the valuation criteria are notable: for each of these the contents of the new civil code rules, the ad hoc professional standard and the related tax regulation are clearly outlined in sequence so to facilitate their comparison and contrast. Frequent examples drawn from the concrete practice of Italian companies assist the reader throughout the description.

The final part contains a series of useful Appendices, which—inter alia—offer a full set of Italian financial statements prepared in accordance with the recently introduced legal rules, as well as comparative tables which help locate Italian financial accounting regulation *vis-à-vis* that of the UK, the US, and the EC Fourth and Seventh Directives. A concise Italian-English glossary of accounting terms and a list of relevant Italian addresses complete the 'toolkit' offered by this section.

Following the objectives of the Routledge book series on accounting in the European Union countries, this volume can be considered as a valuable effort towards the better understanding of each other's 'accounting contexts' by offering a general and knowledgeable picture of the Italian financial reporting legal framework. This way the text contributes to shedding light on an internationally rather less well-known accounting environment.

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Accounting Principles for Life Insurance: A True and Fair View? *Joanne Horton and Richard Macve*. ICAEW Research Board, 1995. xxx+281 pp. £20.

UK life companies will have to publish accounts carrying a 'true and fair' audit report for the first

time in 1995. In the past, life companies have been able to take advantage of special exemptions in the Companies Act and thereby avoid the question of what constitutes true and fair. The traditional basis of life company accounting frequently gives rise to bizarre results. A with-profits office could well find itself reporting sharply increased profits in the same years as it experienced falling business volumes, lower premium rates, lower investment returns and higher overheads. By contrast, a unit-linked life office can easily find itself in a position where the more profitable business it writes, the larger the loss for the year it has to report.

Just how much life companies will have to change their traditional accounting practices in order to comply with the true and fair requirement has been the subject of a good deal of debate over the past five years, but without there being any sign of a consensus emerging. It is against this background that Horton and Macve were commissioned by the Institute of Chartered Accountants in England and Wales's Research Board to consider two questions:

- What method or methods of accounting may be regarded as true and fair for life assurance businesses?
- How the principles of accounting for life assurance relate to the principles of financial accounting and reporting being developed by the Accounting Standards Board.

The main question addressed in the first part of the study is whether the traditional basis, suitably modified to fit the new statutory formats, can give a true and fair view. An important feature of the Horton/Macve approach is the distinction they draw between 'true and fair (actual)' and 'true and fair (ideal)'. True and fair (actual) is a 'legal term of art reflecting only what a court would regard as an acceptable basis of accounting in the light of current statutory requirements and accounting standards taken together with established practice'. By contrast, true and fair (ideal) reflects 'desirable developments in accounting practice towards a more realistic representation of financial performance and position'.

By making this distinction, the authors are able to come to a refreshingly pragmatic conclusion: 'True and fair, itself an ambiguous concept embracing both current expectations and requirements under the law, as well as ideals of what would make for better accounting and reporting, cannot alone bear the weight of requiring wholesale changes in life insurance accounting simply as a result of the implementation of the insurance accounts directive.' Accordingly, the traditional basis can be used in true and fair accounts. The new regulations implementing the directive will require companies to change the presentation of their accounts but not the principles on which they are prepared.

The pragmatic and flexible approach is extended to their discussion of individual issues. On deferred acquisition costs they believe that netting them off against actuarial liabilities, with appropriate disclosure, is as acceptable as showing the gross as a separate asset. The fund for future appropriations can, they conclude, be utilised for all types of business, not just with-profits business. They see no problem in groups using a different basis of accounting in the consolidated accounts from those used in the individual company accounts. They question whether it is helpful to smooth investment results.

This first part of the study is extremely valuable. The analysis of the new regulations and the discussion of the issues is thorough and balanced and, most importantly, gives valuable support to the validity of the 'modified statutory' method which the vast majority of life companies, both mutual and proprietary, are proposing to adopt.

The second part of the study moves on to the wider question of whether the new methods being proposed by various sectors of the industry (such as embedded values or the 'accruals basis') could be regarded as compatible with the general framework of accounting principles and as capable of giving a true and fair view, and what further developments may be desirable.

It is pleasing to see that the authors begin by considering the usefulness to users rather than sentences in SSAP 2 or SSAP 9 being treated as holy writ. They identify three major objectives of financial reporting: 'signalling' expectations to investors, establishing 'property rights' (e.g., dividends, taxation, management bonuses) and 'regulatory'. The property rights and regulatory objectives can, the authors argue, be dealt with by the separate regulatory returns which insurers currently have to publish annually so that the true and fair accounts can focus on the signalling objective.

This approach is misconceived. It ignores the fact that the regulators wish to see closer alignment between the two sets of financial statements and it cannot be assumed that the taxation authorities will accept the regulatory profit rather than the true and fair profit. The preparation of separate statements obviously involves considerable cost to the industry. More fundamentally, a concentration on the signalling objective ignores the useful tension which the conflicting objectives bring to financial reporting.

When it comes to future developments, the authors are cautious. They recommend that companies continue to experiment with embedded value and accruals basis reporting (which they regard as different methods of measuring 'achieved profits' rather than reflecting conflicting accounting principles). They envisage that results on these alternative bases will be presented as supplementary information rather than as an integral part of

the accounts. They call for more actuarial and accountancy guidance, but 'at this stage of development continued experimentation with a variety of practices remains desirable'.

This is a depressingly unambitious conclusion. This is particularly so in the light of the authors' demonstration of how the legal true and fair requirement can be interpreted widely and that the ASB's Statement of Principles should not be regarded as ruling out treatments necessary to reflect the singular features of life assurance business.

Life insurance products are pretty much the same across the industry. Life offices, by and large, face the same risks. The techniques they use for pricing, reserving, determining bonuses and measuring performance for internal purposes are also fairly standard. In these circumstances, it is hard to see why they should not report on a common basis that is broadly consistent with methods used for internal management.

KPMG London

Rupert Yardley

Issues in Business Taxation. *John Pointon (ed.)*. Averbury, 1994. xi+229 pp. £35.

This is an edited collection of papers that are linked together by the theme of taxation. Three of the nine chapters have the editor John Pointon as an author and there is certainly a strong influence of John Pointon in at least one other remaining chapter. I am guessing that the chapter on mathematical programming represents the work of a doctoral thesis supervised by him. Unfortunately, we are not told any biographical details of any of the authors, not even their affiliations, which is a pity. One always likes to know where authors are based and their interests. Equally, in an era of research assessment exercises, I would have thought that the authors would have insisted on being fully identified.

The book itself is divided into three sections. The three chapters in the first section deal with UK taxation and are the chapters whose origin most closely identifies with the editor's own work. The next four chapters deal with European issues in taxation while the final two deal with taxation's multinational aspects.

I found the opening three chapters slightly unsatisfying in places. The issues raised were interesting but I remained unconvinced by their execution. The first chapter is an attempt to link investment appraisal under taxation with the Capital Asset Pricing model adjusted to take account of personal taxation. The author chooses to eschew the existing literature and develop his own model. The implications of the model after a mass of algebra are unclear and seem to depend on the unobservable tax bracket(s) of the shareholder(s).

Chapter 2 looks at various aspects of the leasing decision, including the evaluation of a finance lease. This chapter also reviews a number of surveys, including a survey carried out by the authors, into the motivation behind the decision to lease covering the role played by taxation and by consideration of reporting issues. The final chapter in this first section is devoted to a discussion of the impact of tax exhaustion on project appraisal, including the impact on the lease decision. The author concludes that taxation inextricably links the investment and financing decision. The proposed solution is a mathematical programme, whose formulation covers 10 pages.

Unfortunately this is where the story ends. The model is not used to show that it produces significantly superior results to other methods of corporate tax planning. It should be remembered that many of the constraining equations are merely devices to carry cash tax flows forward for later use, and do not restrict the feasible region in the conventional sense. They merely introduce a timing difference on cash flows. Whether such timing differences are significant or can only be resolved by mathematical programming is a moot point.

Graham Clayton and Peter Harnett open the next section by reviewing tax systems in Europe. I found this a useful and interesting, if somewhat brief, outline of tax systems. This chapter has already made an impact on my teaching in that I am able to draw the attention of our exchange students to how capital structure and dividend policy are affected by their own tax systems. Some of these issues are explored in more depth in the next two chapters.

The first of these explores the tax incentives for investment and debt. This chapter uses the analytical results derived in the opening chapter of the book to try to identify the nature and extent of tax investment incentives available in various European countries for capital construction. It then goes on to look at how their corporate and personal tax systems might influence the level of gearing.

The following chapter explores the debit decision at an empirical level, investigating the difference in capital structures across Europe. It emerges that there are substantial differences between the various countries which are in part explained by institutional difference and partially by other financial variables. The disappointment is that the empirical work is not very formal. No formal statement of model appears and the results are drawn from a whole series of univariate as opposed to multivariate regressions. Particularly disappointing is the fact that the author's modelling of taxation, on his own admission, is naive and the analysis does not draw on the more formal models developed by the editor. Nevertheless, this remains an interesting area for research.

The final section of the book deals with the policy issues involved in tax harmonisation. This turns out to be a hideously complex issue. The authors review the strong arguments for harmonisation in a free market: unharmonised corporate tax systems can distort competition, create an unfair distribution of revenues and distort cross-border economic activity. With these observations the authors review the way to harmonisation and the difficulties faced. Perhaps not surprisingly, the difficulties are winning.

The final section of the book looks at multinational finance. The first chapter of the section deals with the specific issue of CFC-controlled foreign companies, whereby companies operating outside the UK may be deemed by the Inland Revenue to be subject to UK taxation. The final chapter reports on a survey of multinationals, in particular their capital budgeting and financing decisions and attitudes to risk.

In summary, the chapters cover topics in taxation ranging from detailed mathematical structures to open-ended transnational policy issues such as harmonisation. It is probably too selective to be a course reader, though the individual contributions form a useful starting point for many research students who are looking to develop their ideas on taxation beyond that which is normally taught on most undergraduate courses. It also provides much food for thought and useful background material for lectures on either taxation or corporate finance.

University of Bristol

D. J. Ashton

Reporting on Environmental Performance. *The Canadian Institute of Chartered Accountants in Association with Canadian Standards Association, Financial Executives Institute Canada and the International Institute for Sustainable Development.* 1994, 183 pp. C\$37.50.

This is the report of a study group sponsored by, amongst others, the Canadian Institute of Chartered Accountants (CICA), which seeks to provide guidance on the communication of information that should be found in stand alone environmental reports and environmental sections of annual reports. The study group recognises that the CICA has existing expertise in the area of gathering, communicating and verifying information which can be appropriately applied to the provision of environmental information.

The CICA has been proactive in recent years in contributing to the environmental debate within Canada. Previous publications include *Environmental Auditing and the Role of the Accounting Profession* (1992) and *Environmental Costs and Liabilities: Accounting and Financial Reporting Issues*

(1993). In addition, the Canadians have distinguished themselves as the first professional accounting body, to my knowledge, to have seriously considered the implications that the concept of sustainable development may have for the profession in *Environmental Stewardship: Management, Accountability and the Role of Chartered Accountants* (1993).

This current project investigates a number of areas, including environmental disclosures in Canadian environmental and annual reports, surveys from other countries and relevant governmental policy documents. The study group also canvassed the opinions of various user groups, including environmental interest groups, about the usefulness and impact of environmental information currently reported and what they would like to be reported. Directors and senior management of Canadian companies and industry groups were asked about the needs and expectations of external users and the usefulness of existing disclosures. Finally, a cross-section of public accounting practitioners were asked what definitions, measurements, accounting methods and reporting and disclosure practices should be considered for experimentation and development to meet external reporting needs identified from the preceding groups. This is a wide-ranging investigation into reporting considerations.

The report is structured as follows. Chapters 1 and 2 examine the influence of environmental issues on profitability and highlight the need to integrate environment into business strategy. Chapter 3 considers factors relevant to decisions about reporting on environmental performance to external parties with Chapter 4 briefly discussing the desirable attributes of useful environmental information. Chapter 5 looks at environmental performance indicators—an area of some importance as it appears that this will be the predominant focus of future reporting practices. Finally, some pointers on how to usefully present information are provided in Chapter 6.

The report takes as its starting point the growing importance of environmental factors in successfully conducting business. It relates this to competitive advantage but also makes a clear link to questions of stewardship and accountability and how to discharge that accountability. The authors contend that a proactive, strategic response to the environmental agenda requires reporting, which itself necessitates decisions concerning environmental policy, target audiences, communication vehicles and third party verification possibilities. Each of these areas is comprehensively considered.

One of the major contributions of this report is to bring together a body of knowledge about how an environmental report can be created. International surveys of guidelines as well as review of actual reports provide a valuable resource, both in

the report itself, and in accompanying appendices. The report includes five appendices that provide examples of environmental principles and codes of practice, outlines of environmental performance information and details of criteria for environmental reporting awards programmes. The two most valuable appendices, to my mind, contain selected examples of environmental performance indicators and narrative disclosures made by companies, thus providing guidance on how to put their recommendations into practice.

Another valuable and unique aspect of the report is its recognition of the importance the concept of sustainable development is likely to have for companies in the future. The report notes that some organisations 'have adopted comprehensive environmental strategies going beyond compliance [and] have expanded their view of stewardship to cover environmental and related social stewardship issues' (p. xii). In addition, '[o]rganisations committed to sustainable development goals ... attach special importance to accountability relationships—newly recognised as well as long-standing—as part of their societal licence to do business' (p. 15). While this aspect of the report is not well developed it is pleasing to see the accounting profession starting to grapple with the demands that the pursuit of sustainable development may place on it.

In summary, while there is an element of 'Oh no—not another set of guidelines with no binding effect' this comment would not be entirely fair. The CICA has addressed a complex and developing area of corporate reporting very successfully and has pulled material together from a variety of sources in an informative, relevant and user friendly manner. In addition it is to be congratulated for beginning to address the key area of sustainable development. This report is a welcome addition to a growing body of research.

University of Dundee

Jan Bebbington

An International View of True and Fair Accounting. *R. H. Parker and C. W. Nobes.* Routledge, London. xiv+155 pages. £37.50.

This book addresses the fascinating and elusive subject of the true and fair view (hereafter TFFV). It has been compiled by two of the best UK accounting scholars. Their text is a compilation of four previous publications by the authors following an introductory historical review of discussions on the TFFV, and supported by an extensive bibliography from 1944 to 1993 and reproductions of institutional documentation on the concept. The previous publications consist of two empirical studies of, respectively, directors' and auditors' perceptions of the TFFV; an analysis of the TFFV in

the context of the European Community; and a review of the evolving Australian approach to the TFFV. The book is introduced by the chairman of the Accounting Standards Board who neatly captures the main observations and arguments running through the various chapters.

These observations and arguments provide a rich tapestry regarding the nature and role of the TFFV. On the UK position, Parker and Nobes clearly identify the concept as a long-standing legal expression of the quality of reported accounting numbers. It has never been officially defined although numerous writers have attempted to do so.

As the formal prescription of accounting practices has increased, so too has the association of the TFFV with an evolving body of accounting standards. Yet there is a reasonable consensus regarding the interpretation of the TFFV in the context of the specific circumstances of a set of financial statements, a given body of accounting standards at the time of reporting, and an overall bottom line of a court of law as the ultimate interpreter of its existence when statements and standards are matched.

According to legal authority, the TFFV is the reporting criterion that overrides every other legal and accounting rule concerning financial reporting quality. Parker and Nobes clearly demonstrate that this position is supported by academics and standard-setters, and is followed by auditors in practice. Indeed, a reader of this text cannot help but come to the conclusion that, within the UK, the main interested parties in the TFFV are auditors (who are legally required to determine whether financial statements match the quality standard) and lawyers (who are asked to interpret and judge situations in which that matching is in dispute).

The preparers of financial statements appear not to get involved with the TFFV (despite their legal responsibility for the quality of the statements), and Parker and Nobes provide no evidence of statement user reaction to or perception of the concept.

The TFFV situation outside the UK seems to be somewhat different. First, as Parker and Nobes suggest, the non-European (particularly North American) approach to reporting quality is governed strictly in terms of compliance with a prescribed and authoritative body of accounting standards (such as those of the Financial Accounting Standards Board in the US).

This approach appears to have also influenced the Australian approach. Parker and Nobes reveal the history of the Australian situation as it has moved from its origins as a copy-cat of the UK position towards the US model of accounting compliance. They describe this in terms of deharmonisation.

In contrast, the European Community has embraced the UK concept of TFFV in its Fourth

Directive. The result is an uneasy mixture of approaches—some countries being compatible with the UK (i.e. the TFV override with underlying accounting standards), and others being at various stages prior to that position (e.g., developing standards to underly the override).

The most interesting feature of the Parker and Nobes analysis is that an examination of the life and times of the TFV concept is effectively a scrutiny of the behaviour and relationship of two professions—accountancy and law. Originally conceived by legal draftsmen as a vague legalistic rule of thumb to assist in court interpretations of financial reporting quality, it quickly and inevitably captured the interest of accountants as preparers and auditors of financial statements.

Neither professional grouping has any incentive to cause the TFV to be defined or removed and substituted by accounting compliance. Each has considerable economic self-interest in maintaining the vagueness and ambiguity of the present undefined position. It provides accountants, auditors and lawyers with the flexibility needed to cope with individual reporting circumstances.

Reporting quality is virtually a moving target in countries using the TFV despite extensive programmes of accounting standards. As Parker and Nobes report, the concept becomes a mystery and, to some extent, an elaborate ritual. Thus, it is compatible with the general framework of the socialisation of professions, having as much to do with

maintaining the professionalism of accountants and lawyers as with the reporting quality.

Every reviewer reviews with a bias and this reviewer is no exception. My bias is that the importance of research into the TFV concept lies with the sociology of the accountancy profession rather than with questions of meaning, interpretation or international difference. The latter appear to be symptoms of the condition rather than the condition itself. Parker and Nobes have done a fine job in identifying the symptoms. They have been less strong on the condition. Nevertheless, they have produced an important collection of writings and other materials on the TFV.

If it is to be updated at some future point, it would be helpful to edit the individual reproductions so as to eliminate redundant material. Similar points are made in several of the chapters, and the text would have read more easily with appropriate editing. I hope that future editions will appear because the Parker and Nobes analysis strongly suggests that this is merely an interim report.

As the relationship between accountancy and law develops, and as countries throughout the world harmonise or deharmonise with respect to the TFV, researchers such as Parker and Nobes will have plenty of material to continue the debate. Please read this book.

University of Alabama

Tom Lee

Accounting and Business Research

**The Measurement of Harmonisation and the Comparability
of Financial Statement Items: Within-Country and
Between-Country Effects**

Creative Accounting and Investment Analyst Response

**The Financial Reporting Practices of British Municipal
Corporations 1835–1933: A Study in Accounting Innovation**

**Decentralisation as a Moderating Factor in the Budgetary
Participation–Performance Relationship: Some Hong Kong
Evidence**

**An Evaluation of the Decision Usefulness of Cash Flow
Statements by Australian Reporting Entities**

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22 JAN 1996



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Contents

The Measurement of Harmonisation and the Comparability of Financial Statement Items: Within-Country and Between-Country Effects	Simon Archer Pascale Delvaille Stuart McLeay	67
Creative Accounting and Investment Analyst Response	Gaëtan Breton Richard J. Taffler	81
✓ The Financial Reporting Practices of British Municipal Corporations 1835–1933: A Study in Accounting Innovation	Hugh M. Coombs John Richard Edwards	93
Decentralisation as a Moderating Factor in the Budgetary Participation–Performance Relationship: Some Hong Kong Evidence	Ferdinand A. Gul Judy S. L. Tsui Steve C. C. Fong Helen Y. L. Kwok	107
An Evaluation of the Decision Usefulness of Cash Flow Statements by Australian Reporting Entities	Stewart Jones Claudio A. Romano Kosmas X. Smyrnios	115
Book Reviews		130

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The Measurement of Harmonisation and the Comparability of Financial Statement Items: Within-Country and Between-Country Effects

Simon Archer, Pascale Delvaille and Stuart McLeay*

Abstract—This paper reports on an analysis of accounting policy choices made by European companies with an international shareholding. The accounting policies analysed in depth in this paper comprise the treatment of goodwill and accounting for deferred taxation. In the paper, the van der Tas comparability index is developed by separating the index into two components relating to the within-country (intra-national) effects of domestic standardisation and the between-country (inter-national) effects of harmonisation. It is shown in this paper that the value of the index may be interpreted as the probability that two companies selected at random will report financial information that is comparable, and that the lowest level of comparability exists when the accounting methods are assumed to be distributed equiprobably over the companies, the outcome of a random selection of accounting policies. The paper also considers the problems of non-disclosure, and a comprehensive 'disclosure-adjusted' comparability index is proposed.

Introduction

This paper reports on an analysis of accounting policy choices made by European companies with an international shareholding. The companies in the sample are based in Belgium, France, Germany, Ireland, the Netherlands, Sweden, Switzerland and the UK. The accounting policies analysed in depth in this paper comprise the treatment of goodwill and accounting for deferred taxation.

The main purpose of our analysis is to study the impact of accounting harmonisation on the financial reporting practices or policy choices of the companies in our sample. These companies in particular are likely to be the focus of attention of financial analysts carrying out international comparisons. In this context, we have taken as our

methodological starting point the comparability 'C' index introduced by van der Tas (1988), and later discussed in Tay and Parker (1990, 1992) and van der Tas (1992a, 1992b), a method that we develop by separating the index into two components relating to the within-country (intra-national) effects of domestic standardisation and the between-country (inter-national) effects of harmonisation. We also propose a comprehensive 'disclosure-adjusted' comparability index incorporating non-disclosures.

We also identify in this paper the minimum level of the comparability index. For any given numbers of companies and of different accounting methods for a particular financial statement item, the lowest level of comparability exists when the accounting methods are assumed to be distributed equiprobably over the companies, the outcome of a random selection. Other things being equal, comparability increases when the choices made by companies converge towards a generally accepted method or when the number of accounting methods in use is reduced.

The C index proposed by van der Tas as an indicator of harmonisation effects is a measure of the extent to which accounting information disclosed by companies is comparable. Indeed, the index can be interpreted as a model of interfirm comparison, as it measures the proportion of pairwise comparisons that are feasible given the alternative accounting methods adopted by different companies.

*The authors are, respectively, at the University of Surrey, Ecole Supérieure de Commerce de Paris, and the University of Wales, Bangor. They are grateful to Jean-Bruno Dufour and Wolfgang Dick for their research assistance, to the Institute of Chartered Accountants in England and Wales for financial support provided during the first phase of this project and to Groupe ESCP for financial support during the second phase. The authors also wish to thank Sid Gray for his useful comments as discussant, as well as other participants at the following conferences where an earlier version of the paper was presented: British Accounting Association, April 1994; European Accounting Association, April 1994; University of Wales Gregynog Colloquium, May 1994; and Association Française de Comptabilité, June 1994. Correspondence should be addressed to Professor S. McLeay at the School of Accounting, Banking and Economics, University of Wales, Bangor, Gwynedd LL57 2DG.

The C index is a measure of accounting *harmony* (a state) in a population of companies, while the change in the value of the C index over time is a measure of accounting *harmonisation* (a process). With respect to a given financial statement item subject to a particular area of accounting policy, the value of the index may be interpreted as the probability, p , that two companies selected at random will report financial information that is comparable. Essentially, p may be interpreted as the unconditional probability of interfirm comparability, as p is calculated as the proportion of pairs of companies that are comparable with respect to the financial statement item in question out of the maximum number of pairs that may be selected from the entire population of companies.¹ The C index thus measures the comparability of financial statements on an item-by-item basis. It is not a measure of their overall comparability.

The mathematics of the comparability index

The Basic C Index

The basic C index measures direct comparability of reported accounting numbers which are treated as comparable only in those cases where the same accounting method is used by any two companies. That is, the basic index is calculated without taking account of supplementary information of a kind which may assist the reader to make adjustments necessary to achieve comparability. It should be noted that van der Tas (1992a) also uses an extended index, which includes those cases where information reported in the notes to the accounts would allow the reader to re-estimate the reported numbers in accordance with one or more alternative methods. However, this paper is restricted to the issue of direct comparability where there exists a mutually exclusive choice between two or more alternative accounting methods.

As an example, consider a situation where a choice is to be made between two accounting methods by five companies, a, b, c, d and e. Companies a and b choose method 1 and compa-

nies c, d and e choose method 2. Therefore, the number of comparable sets of accounts is four; that is, comparison is possible in the case of (a, b), both of which adopt method 1, and (c, d), (d, e) and (c, e), all three of which adopt method 2.

To generalise using notation appropriate to combinatorial mathematics, the number of combinations of n companies taken r at a time is given by

$$\binom{n}{r} = \frac{n!}{(n-r)!r!}$$

which simplifies to $\frac{1}{2}n(n-1)$ for pairwise comparisons.² From the sample of size n , we are able to count the numbers of companies adopting each of the different accounting methods. We use the notation x_j to indicate the number of companies selecting the j th of 1 to J accounting methods, and the number of pairwise comparisons amongst the x_j companies using that particular method is given by

$$\binom{x_j}{2} = \frac{1}{2}x_j(x_j - 1)$$

where x_j is substituted for n and where $r = 2$. We obtain the total number of pairwise comparisons that are possible given the choices of method made by the companies in the sample (the numerator of the C index), $\frac{1}{2}\sum_j(x_j(x_j - 1))$, by summing the combinations over the methods. Thus, in the case of the example above, the total number of pairwise comparisons is:

Number of pairwise comparisons

$$\begin{aligned} &= \frac{1}{2}\sum_j(x_j(x_j - 1)) \\ &= \frac{1}{2}(2 \times 1) + \frac{1}{2}(3 \times 2) = 1 + 3 = 4. \end{aligned}$$

The C index itself is a measure of the total number of feasible pairwise comparisons expressed as a proportion of the maximum possible number of comparisons that could be made in the event that all companies were to choose the same accounting method. This maximum, i.e. the denominator of the C index, is given by $\frac{1}{2}\sum_j x_j(\sum_j x_j - 1)$, where $\sum_j x_j$ is the total number of companies in the sample. Thus, for the five companies in the example above, the index is calculated as follows:

Van der Tas C index

$$\begin{aligned} &= \frac{\frac{1}{2}\sum_j(x_j(x_j - 1))}{\frac{1}{2}\sum_j x_j(\sum_j x_j - 1)} \\ &= \frac{(\frac{1}{2}(2 \times 1) + \frac{1}{2}(3 \times 2))}{\frac{1}{2}(5 \times 4)} = \frac{4}{10} = 0.40 \end{aligned}$$

The C index provides a measure of uniformity in accounting policy choice at a given point in time, and the change in the index provides a measure of the convergence of accounting policy choice for a particular financial statement item through time. This convergence may occur in response to new accounting standards or because companies voluntarily adopt what they perceive to be the method

¹In statistical terms, p is the unconditional probability for the entire sample space, which in turn may contain subsets within which separate conditional probability statements may be made. One of the subsets in the case of harmonisation studies is the country in which a subsample of companies is registered, and a conditional probability of interfirm comparison will exist for each country. This issue is developed later in the paper.

²For n companies, the number of permutations is factorial n , that is $n! = n \times (n-1) \times (n-2) \dots 3 \times 2 \times 1$, and the number of permutations of n companies taken r at a time is given by $n!/(n-r)!$. This simplifies to the second factorial $n(n-1)$ for pairwise permutations, and, to $\frac{1}{2}n(n-1)$ for pairwise combinations.

Table 1
The Basic Grid of Sample Counts x_{ij}

		<i>jth accounting method</i>		<i>Totals</i>
		1	2	
<i>ith country</i>	1	x_{11}	x_{12}	x_{1+}
	2	x_{21}	x_{22}	x_{2+}
<i>Totals</i>		x_{+1}	x_{+2}	x_{++}

generally accepted at the international level. For example, if, as a result of uniformity at the international level, national regulations were to converge on a single accounting method which companies adopt universally, comparability would increase in the case of the above illustration from 40% to 100%.

Measuring International Comparability

In previous research in this area, a distinction has been made between inter-national and intra-national comparability (van der Tas, 1988; Emenyonu and Gray, 1992). While the C index outlined above has been used as the appropriate measure of comparability at the national or global level, a separate index known as the I index has been used as a measure of inter-national, or between-country, comparability.³

It should be recognised, however, that the C index itself may be decomposed in a way that allows us to distinguish between comparability within countries and comparability between countries. In this way, the decomposition of a single index is able to provide a basis for distinguishing between, first, the impact of standardisation of accounting method on interfirm comparison within individual countries and, second, the effects of harmonisation on international interfirm comparison. This is illustrated below.

A two-dimensional array sets out the data for the examples that follow, showing the number of companies in the *ith* country adopting the *jth* accounting method, x_{ij} . The double subscripts refer to the position of the cells in the arrangement. For instance, x_{12} refers to the number of companies in country $i = 1$ adopting method $j = 2$. A 2×2 version of the grid is displayed in Table 1.

The marginal totals x_{i+} and x_{+j} are summed over the subscripts j and i , respectively, as indicated by replacing the relevant subscript with '+'. For

example, the marginal total x_{1+} is the total number of companies in country $i = 1$ adopting both accounting methods $j = 1$ and $j = 2$. The marginal total x_{+1} is the total number of companies selecting method $j = 1$ in both countries $i = 1$ and $i = 2$. The total number of companies, n , is denoted as x_{++} .

The number of pairwise comparisons that may be made in the *ith* country amongst companies selecting the *jth* accounting method is $\frac{1}{2}x_{ij}(x_{ij} - 1)$. Therefore, the total number of comparisons that may be made between companies operating within the same countries is given by the sum of the combinations for the four cells, $\frac{1}{2}\sum_i \sum_j (x_{ij}(x_{ij} - 1))$, that is, for the 2×2 example,

$$\begin{aligned} & \frac{1}{2}x_{11}(x_{11} - 1) + \frac{1}{2}x_{12}(x_{12} - 1) \\ & + \frac{1}{2}x_{21}(x_{21} - 1) + \frac{1}{2}x_{22}(x_{22} - 1). \end{aligned}$$

This will be referred to as *within-country* comparability.

The number of pairwise comparisons that may be made between companies selecting the *jth* accounting method but operating in different countries is given by the sum of the products between cells within each category of accounting method, divided by two as these are combinations not permutations. This will be referred to as *between-country* comparability which, for the above grid, is equal to $x_{11}x_{21} + x_{12}x_{22}$ (the comparisons between countries $i = 1$ and $i = 2$ for, first, method $j = 1$ and, second, method $j = 2$). Given that the number of companies outside the *ith* country using the *jth* method is equal to $x_{+j} - x_{ij}$, it follows that between-country comparability may be expressed as $\frac{1}{2}\sum_i \sum_j (x_{ij}(x_{+j} - x_{ij}))$.

Within-country and between-country comparability indices may be constructed by dividing the numbers of feasible within-country and between-country pairwise combinations as stated above by their respective maxima, $\frac{1}{2}\sum_i (x_{i+}(x_{i+} - 1))$ and $\frac{1}{2}\sum_i (x_{i+}(x_{++} - x_{i+}))$. After multiplying all terms by 2, the resultant indices may be expressed as follows:

Within-country comparability index

$$\frac{\sum_i \sum_j (x_{ij}(x_{ij} - 1))}{\sum_i (x_{i+}(x_{i+} - 1))}$$

Between-country comparability index

$$\frac{\sum_i \sum_j (x_{ij}(x_{+j} - x_{ij}))}{\sum_i (x_{i+}(x_{++} - x_{i+}))}$$

The total number of feasible pairwise comparisons is the sum of the within-country and between-country totals, as follows:

$$\begin{aligned} & \frac{1}{2}\sum_i \sum_j (x_{ij}(x_{ij} - 1)) + \frac{1}{2}\sum_i \sum_j (x_{ij}(x_{+j} - x_{ij})) \\ & = \frac{1}{2}\sum_j (x_{+j}(x_{++} - 1)) \end{aligned}$$

It can be seen that, unlike its within-country and between-country components, the total number of

³The inter-national comparability index, I , is the sum, over the alternative methods $j = 1, \dots, J$, of the squared geometric means of the frequencies of their use in the countries included in the sample. For $i = 1, \dots, I$ countries, and where x_{ij}/x_{i+} is the frequency of use of method j in country i , the index may be stated as $\sum_j \Pi_i (x_{ij}/x_{i+})^{1/(I-1)}$.

Table 2
An Example of Minimum Comparability

A. Policy choices

Country		Accounting method			Totals
		<i>j</i> = 1	<i>j</i> = 2	<i>j</i> = 3	
	<i>i</i> = 1	5	5	5	15
	<i>i</i> = 2	10	10	10	30
Totals		15	15	15	45

B. Pairwise comparisons

	Number of pairwise comparisons	Maximum	Comparability indices
Within-country comparability	165	540	30.6%
Between-country comparability	150	450	33.3%
Total	315	990	31.8%

feasible pairwise comparisons does not itself depend on the counts in individual cells, the x_{ij} s, but on the marginal counts, the x_{+j} s. Thus, the overall C index may be stated as follows:

Total comparability index

$$\frac{\sum_j (x_{+j}(x_{+j} - 1))}{x_{++}(x_{++} - 1)}$$

Minimum Comparability

The minimum level of comparability exists when companies choose equally between different accounting methods, the expected outcome in statistical terms of a random selection procedure. Accordingly, for J accounting methods, we may substitute x_{++}/J for x_{+j} and it may be seen that the minimum of the comparability index would be as follows:

$$\frac{J \left(\frac{x_{++}}{J} \left(\frac{x_{++}}{J} - 1 \right) \right)}{x_{++}(x_{++} - 1)}$$

which tends to $1/J$ as the number of companies x_{++} increases. Departure from an equal distribution of choices would increase the number of feasible pairwise comparisons. For instance, the number of pairwise comparisons between companies selecting from any two methods in equal proportions is $\frac{1}{2}(x(x-1) + x(x-1)) = x^2 - x$, and a change of method by one company would result in a number of pairwise comparisons equal to $\frac{1}{2}([x+1]([x+1]-1) + [x-1]([x-1]-1)) = x^2 - x + 1$, an increase of one.

Table 2 presents the comparability indices arising in the case of an example of equal choice amongst methods in each of two countries, where 15 companies in country 1 and 30 companies in country 2 select from three accounting methods. It can be seen in this example that the minimum level

of comparability overall is 31.8% of the maximum, the latter being the number of comparisons that would occur if all firms were to select the same accounting method.

As indicated earlier, we may also distinguish pairwise combinations of companies in the same country selecting the same accounting method (within-country or intra-national comparison) from pairwise combinations of companies in different countries adopting the same method (between-country or inter-national comparison). For the distribution of choices shown here, the lack of national uniformity has reduced within-country comparability from a maximum of 540 to 165 pairwise comparisons, or 30.6%. The effect on international comparison has been to reduce between-country comparability from a maximum of 450 to 150 pairwise comparisons, or 33.3%.

It was shown above that computation of the overall C index requires information regarding only the marginal counts, the x_{+j} s. It follows that, although the minimum level of overall comparability is achieved when the numbers of companies choosing each accounting method are equal for the sample as a whole, this pattern does not have to hold in each country. Nevertheless, it is worth noting that the minimum number of within-country comparisons occurs when equal choices are made in each country (as in Table 2), while the minimum number of between-country comparisons will depend on sample design. A further example, this time illustrating the minimum level of between-country comparability, is given in Table 3.

Non-disclosure and the comparability index

Problems of Non-disclosure

The comparability index has been constructed in a restricted manner in previous studies, whereby

Table 3
An Example of Minimum Between-country Comparability

A. Policy choices

		<i>Accounting method</i>			<i>Totals</i>
		<i>j = 1</i>	<i>j = 2</i>	<i>j = 3</i>	
Country	<i>i = 1</i>	15	0	0	15
	<i>i = 2</i>	0	15	15	30
Totals		15	15	15	45

B. Pairwise comparisons

	<i>Number of pairwise comparisons</i>	<i>Maximum</i>	<i>Comparability indices</i>
Within-country comparability	315	540	58.3%
Between-country comparability	0	450	0.0%
Total	315	990	31.8%

companies not reporting on a given item or not disclosing the accounting method used are excluded from the index. As a result, it is likely that increases in comparability reported in the past are attributable to an overwhelming extent to changes in the applicability of certain accounting methods as well as changes in the level of financial disclosure (McLeay, 1993). Below, we reconsider this issue and suggest some adjustments that might be made.

Non-disclosure of Method

In some instances, companies may provide insufficient information to allow the reader to determine the precise nature of the accounting method used. Without supplementary information, there are two interpretations of the behaviour of non-disclosers of method. First, a 'default assumption' can be made that the company in question has used the method applicable to its circumstances, such as the method required by law in its country of registration. In this case, the financial statements may be assumed to be comparable with others prepared using that method. Alternatively, it may not be possible to make such a default assumption, in which case the financial statements are not comparable with respect to the item in question.

In the first case, where a 'default' method can be assumed, it would be appropriate to include such a company in one of the comparable subsets, the x_{+j} s, from which the index numerator is calculated and, consequently, in the total x_{++} from which the

denominator is calculated. In the latter case, however, it would seem appropriate to include the company only in the denominator of the comparability index, but not in the numerator. In the analysis reported later in this paper, there were no circumstances where we were able to make default assumptions.

Non-disclosure of Item

In some cases, a particular accounting item may not be reported in a company's financial statements. For example, this would be the case where a company reports no goodwill. Here, an assumption might be made that this reflects the fact that no acquisitions have taken place.⁴ Where such an assumption can be made, implying that the company has not needed to make an accounting policy choice, the financial statements may be considered as comparable with other companies without acquisitions and with companies reporting goodwill, regardless of the method used. That is, the definition of comparability can include the universal comparability of such a company where the impact on the financial statements would remain the same whichever policy is considered, as the item is assumed to have been omitted because its value is zero. In this case, the numerator of the index would be increased by the number of pairwise comparisons between companies in subset j' and all other companies, that is by $x_{+j'}(x_{++} - x_{+j'})$.

With respect to the two issues raised above, the solution proposed here is to compute a 'disclosure-adjusted' comparability index which includes the effect of non-disclosure of items and the use of default methods in the index numerator where appropriate and which includes all possible comparisons, including non-disclosures of method and of items in the index denominator. The proposed 'disclosure-adjusted' comparability index may be compared with the unadjusted C index as follows:

⁴An alternative assumption would be that the amount of goodwill arising is zero, such as in the case where the book value of acquired subsidiaries is equivalent to the purchase price. In countries where elimination of goodwill against reserves is allowed without the cumulative amount of such eliminations having to be disclosed in the Notes, there is also the possibility that all goodwill has been eliminated without trace.

Van der Tas C index

{Pairwise comparisons between companies using same method} ÷ {Maximum pairwise comparisons between companies disclosing method}

Disclosure-adjusted index

{Pairwise comparisons between companies using same method (including the default method) plus pairwise comparisons with and between companies which did not include the item in their financial statements} ÷ {Maximum pairwise comparisons between all companies (including all disclosers and non-disclosers)}

The analysis of accounting practices

In this section, we describe how we analysed the accounting practices studied in this paper for the purpose of measuring the degree to which harmony existed in 1986/87 and 1990/91 and hence the process of harmonisation (i.e. the change in harmony) between those years.

For the sample on which our analysis is based, we selected companies in eight European countries whose shares are traded internationally and which, therefore, are likely to be influenced by international factors and country-specific factors in the selection of accounting methods. The companies were first selected in 1986 (see Archer, McLeay and Dufour, 1989) and, for the purpose of this analysis, the financial statements of the same set of companies were reviewed again for the 1990 calendar year (or for accounting periods over 1990/91).

As we discussed in the second section of this paper, the measurement of accounting harmonisation raises some challenging issues of methodology. Comparability of a financial statement item obviously presupposes disclosure of that item in either the financial statements or the notes (disclosure harmony). Given disclosure harmony, comparability further depends on the similarity of the accounting recognition and valuation rules employed for the items disclosed (measurement harmony). In this context, it must be recognised that comparison involves a degree of subjective judgment as to what is comparable. In other words, how close does the similarity between the accounting methods used for a particular financial statement element need to be, in order for the figures for that component reported by different companies to be considered comparable? At what

level of detail, therefore, should the degree of harmony be measured? For example, in the case of deferred taxation, we had to make a decision as to the materiality, for comparison purposes, of the difference between the 'deferred' and 'liability' methods, given what we saw as the major difference between the 'full provision' and 'partial provision' methods.

Likewise, there are problems of interpretation of the financial information that is disclosed. In the case of a group reporting no deferred tax, for example, does this mean that the relevant tax regimes are such that no significant temporary differences arise for group companies (i.e. that the answer is 'not applicable'), or that the group is ignoring them and the answer is that it is using the 'nil provision' or 'taxes payable' method? Generally, the notes on accounting policies allow such questions to be answered, but not in all cases.

In this paper, we consider two areas of accounting policy, deferred taxation and goodwill. Below, we describe our analysis of the selected accounting practices indicating how the methodological problems that have arisen have been dealt with.

Deferred Tax

Accounting policy issues. The rationale for accounting for deferred tax arises primarily from differences between reported profit before tax and taxable income which are not of a permanent nature, but result from charges or credits being recognised for tax purposes in different periods from those in which they are recognised for financial reporting purposes. As a result of these temporary differences,⁵ tax on part of profits is paid either sooner or later than it would have been if the calculation of tax payable had been made on the basis of reported profits. However, the total amount of taxable profit over the life of the business is not affected, because the temporary differences 'reverse'. The reversal of a temporary difference causes a deferred tax liability or asset to 'crystallise', except to the extent that a new temporary difference arises to offset it.

The most common example is the use of different methods or economic lives for depreciation of fixed assets for reporting and for tax purposes. For example, the use of linear depreciation for reporting purposes and accelerated depreciation for tax purposes leads to a reduction of tax payable in the early years of the asset's life, which is liable to be compensated by an increase in tax payable as the differences reverse in the later years of its life. The principles of 'prudence' and 'matching' may be interpreted as requiring that provision be made for this anticipated increase in future tax payable (i.e., for the reversal of the temporary differences) by recognising a deferred tax liability which builds up through additional charges made against profit

⁵The term 'temporary differences' is used in SFASs 96 and 109 rather than '[reversible] timing differences' as used in APB 11 and SSAP 15. More generally, however, the term 'temporary differences' may be used to refer to differences between the value of a balance sheet item for tax purposes (its 'tax basis') and its value for financial reporting purposes.

during the years of reduced tax payable and reduces through credits made to profit during the years of increased tax payable as the temporary differences reverse. The effect of this (subject to applicable tax rates remaining constant) is to remove the effects of the temporary differences on reported profit after tax, which is calculated more or less as though the tax charge was based on reported profit before tax.

Such a procedure raises two kinds of issue:

1. Will deferred tax liabilities actually crystallise, or will the reversals be offset by new temporary differences arising on new asset acquisitions? In the latter case, is there any need to make provisions in respect of such temporary differences? This is the issue of *full* versus *partial* provision. The full provision method provides for all temporary differences; the partial provision method does not provide for temporary differences so long as they are not expected to reverse.

This is essentially a recognition issue: should a liability be recognised that is not expected to crystallise because the related temporary differences are not expected to reverse?

There are additional recognition issues arising from the 'prudence' principle in relation specifically to deferred tax assets when the temporary differences are such as to result in tax being paid sooner not later. For example, while SFAS 96 issued in the US required that net (or 'naked') deferred tax assets be recognised only to the extent that the enterprise can obtain a refund of taxes previously paid, its successor SFAS 109 treats the matter as a valuation issue to be dealt with by '[deducting] valuation allowances if it ... is more likely than not ... that some portion or other of the deferred tax assets will not be realised'. Neither of these US standards was in force during the period covered by our study, but they usefully illustrate different approaches to the issue in question.

2. Given that a liability (or asset) is to be recognised, how is its amount to be calculated? Should the tax rate applicable in the original year of recognition be used, or should the rate be used that is expected to be in force when the liability (or asset) is likely to crystallise, thus determining its expected amount? This is the issue of the *deferral* versus the *liability* method of provision. The deferral method uses the tax rate of the original year of recognition, the liability method normally the most recent tax rate. This is essentially a valuation or measurement issue.

From the analysis just given, it is apparent that there are in principle four main methods of ac-

counting for deferred tax: (1) full provision, deferral method; (2) full provision, liability method; (3) partial provision, liability method; and (4) partial provision, deferral method. The logic of the fourth method might be questioned, on the grounds that the rationale of the partial provision basis of recognition is to avoid providing for non-existent liabilities, and that liabilities which are recognised should logically be valued in such a way as to provide the best estimate of the amount likely to be payable.

With regard to recommended practice, the initial framework for deferred tax accounting had been provided in the US by APB 11 and in the UK and in Ireland by SSAP 11. Both pronouncements recommended a full provision using the deferral method to calculate the provision. In the US, APB 11 was replaced by SFAS 96 in December 1987, and SSAP 11 was superseded in the UK and in Ireland by SSAP 15 in 1985. Both standards now favour the use of the liability method of calculating the amount payable at the current rate of tax, but, while SFAS 109 follows SFAS 96 in requiring full provision to be made for all future effects of temporary differences, SSAP 15 requires a partial provision. Surveys carried out in both Ireland and the UK, as reported by Brennan, O'Brien and Pierce (1992) and Gordon and Gray (1994), reveal that the interpretations placed on the partial provision are such that some companies provide for substantially all temporary differences and others for a negligible proportion, with no provision where the liability is not probable.

The Fourth and Seventh EC Directives contain no requirements in respect of deferred taxation. IAS 12, *Accounting for Taxation on Income*, is compatible with both SSAP 15 and SFAS 96.

National accounting standards and practices. In France, the 1986 Accounting Decree, which implemented the Seventh EC Directive, took the opposite position to that set down in law for individual company accounts and required that deferred tax should be accounted for in consolidated accounts. No method of calculating deferred tax was specified in the Decree, nor had this been mentioned previously in the consolidation instructions of the Plan Comptable of 1982 (Scheid and Walton, 1992). However, OECCA published a recommendation on deferred tax in 1987, specifying full provision on a liability basis.

In Germany, accounting for deferred taxation is governed by section 274 of the commercial code (*Handelsgesetzbuch*, or HGB), where it is required that the general provision for taxation should include any probable future tax charges arising from the difference between taxable profits and reported profits, although this is less likely to be the case in Germany due to the general consistency between the policies used for preparation of the annual financial statements and those used for tax

computation. In addition, according to Ordelheide and Pfaff (1994), there is little difference in law between the treatment of deferred tax at present and the provision for taxation as understood prior to the 1985 modification of the HGB, and many companies have not modified their traditional practices. With regard to group accounts, where further tax effects may arise on consolidation, section 306 of the commercial code contains the more specific requirement that deferred taxation be separately reported. However, when reversal of temporary differences is not foreseen in the near future, the provision takes on a quasi-permanent nature and, as such, is again not reported separately.

In the Netherlands, the provision for deferred taxation must be stated separately, either on the face of the accounts or in the notes. According to Dijkema and Hoogendoorn (1993), a partial provision is not allowed under Dutch law, and this is the recommendation from the Council for Annual Reporting, the *Raad voor de Jaarverslaggeving*, as contained in its guideline RJ.2.53.509. Furthermore, the liability method is required under guideline RJ.2.53.515, although the deferral method was permitted until 1992. It is worth noting that some Dutch companies value deferred tax at discounted present value.

In Sweden, during the period of our study, neither the Accounting Act nor the Companies Act recognised deferred tax accounting, although the Swedish Institute of Authorised Public Accountants, the *Föreningen Auktoriserade Revisorer* (FAR), has recommended that, in consolidated accounts, deferred tax liabilities in acquired subsidiaries should be deducted from 'untaxed reserves' which are shown as part of equity (Heurlin and Peterssohn, 1992). Such 'untaxed reserves' are a feature of the Swedish and certain other business environments, being similar to the German *Sonderposten mit Rücklageanteil*, although the latter are shown below, and not included in, equity. Another aspect particular to Sweden during this period was the calculation of net profit after tax in two stages: in the first stage, pre-tax profit is adjusted by special debits or credits laid down by the tax code, in order to arrive at taxable profit; the applicable tax charge is then deducted. The corresponding balance sheet effects are taken to 'untaxed reserves', and not disclosed as a separate tax provision.

The situations in the UK and in Ireland have already been indicated above.

Classification of accounting policies for deferred tax. Within the framework established earlier, it can be seen that three potential combinations of deferred tax accounting methods were required or recommended in various European countries prior to and during the period of our study:

1. Full provision, deferral method (as required by APB 11 and SSAP 11, and, possibly but with less specific disclosure requirements, under the German Commercial code from 1987).
2. Full provision, liability method (as required by SFAS 96; in France, by the OECCA recommendation of 1987; and in the Netherlands from 1992).
3. Partial provision, liability method (as required by SSAP 15 applicable in both the UK and Ireland).

At the time when our 1986/87 data were being analysed (early 1989), SFAS 96 had not come into force; it did not do so until the fourth quarter of 1990, and then only on a voluntary basis. The main methods found in practice were similar either to APB 11 (which was still in force) or to SSAP 15. Thus, our data for 1986/87 do not distinguish between methods 1 and 2. In any event, from the comparability perspective, it seemed to us that the recognition difference between full and partial provision was likely to be much more significant than the measurement difference between deferral and liability. Only in the event of a very significant change in tax rates, or where deferred tax balances were large relative to net assets, would the latter difference be material.

Bearing in mind all of the above, in our analysis we decided on the following classification of policies in accounting for deferred tax:

Policy

- A Nil provision or 'taxes payable' approach;
- B Full provision;
- C Partial provision;
- D1 Deferred tax recognised but method (full or partial provision) unspecified;
- D2 Deferred tax recognised only for some group companies (normally foreign subsidiaries);
- E No recognition of deferred tax, and it is not known whether or not deferred tax accounting is applicable.

From the comparability perspective, this classification raises some further issues. As a general rule, groups are comparable with others in the same category, and only with those; but this is not the case for all categories. It seems reasonable to consider those companies following a 'nil provision' policy (method A) as comparable with others adopting A, those companies following a 'full provision' policy (method B) as comparable with others adopting B, and those following a 'partial provision' policy (method C) as comparable with others using C. On the other hand, companies not recognising any deferred tax (method E), without explaining whether they are

Table 4
Deferred Tax Cross-classifications

	1986/87						1990/91					
	Accounting method						Accounting method					
	A	B	C	D	E	Total	A	B	C	D	E	Total
Belgium	2	0	1	0	1	4	2	1	0	0	1	4
France	0	6	5	1	0	12	0	8	4	0	0	12
Germany	0	2	1	15	4	22	0	4	4	12	2	22
Ireland	0	0	3	0	1	4	1	0	3	0	0	4
Netherlands	0	6	2	4	0	12	0	6	1	4	1	12
Sweden	8	1	0	3	1	13	2	5	1	5	0	13
Switzerland	0	0	0	2	2	4	0	0	3	1	0	4
UK	0	0	18	0	0	18	0	0	18	0	0	18
Total	10	15	30	25	9	89	5	24	34	22	4	89

Key. A: Nil provision (taxes payable method); B: Full method; C: Partial method; D: Deferred tax recognised but method unspecified; E: No recognition of deferred tax and it is not known whether or not it is applicable.

following a 'nil provision' policy or have no temporary differences because of their particular tax situation, are not comparable even with others falling in category E.

The problematic categories are D1 and D2. It would seem that companies recognising deferred tax without specifying whether they are following the 'full' or the 'partial' provision policy (method D1) are not comparable even with others in that category. Typically, consolidated groups recognising deferred tax only for some group companies (normally foreign subsidiaries) also do not specify whether the full or partial provision policy is followed. Hence, we chose to consider companies falling in category D2 (of which there were very few) as not being comparable with others in that category. Consequently, we combined D1 and D2 in a single category for our analysis.

Analysis of deferred tax accounting policy choices. The cross-classification of methods of tax accounting adopted by 89 companies from eight countries in two separate periods 1986/87 and 1990/91 is set out in Table 4.

Overall, there was a decline in the number of companies using the taxes payable method and an increase in deferred tax accounting, both in the case of the partial provision method and the full provision method. Nevertheless, non-disclosure remained a serious barrier to comparability. A substantial number of companies recognising deferred tax did not disclose the deferred tax method used and a small number of companies not recognising deferred tax did not indicate whether or not it is applicable. However, in both cases, the number of companies not disclosing sufficient information decreased.

The conclusions reached above are reflected in the disclosure-adjusted comparability indices presented in Table 5. There is an increase in overall

comparability, but from just 14.94% in 1986/87 to 21.63% in 1990/91. It should be recalled that, in calculating the comparability indices, the financial statements of companies falling in categories D (deferred tax method unspecified) and E (not known if deferred tax accounting is applicable) were treated as non-comparable. For instance, if there had been full disclosure of the deferred taxation accounting method by each company in the sample, then given a choice of three methods, the minimum level of comparability would have approximated 33%. However, in view of the levels of disclosure observed (55 disclosing companies choosing between three methods in 1986/87, increasing to 63 disclosing companies in 1990/91), the effective minimum level of comparability overall increased from 12.17% in 1986/87 to 16.09% in 1990/91. Thus, on the basis of these index values, the observed increase in the comparability index (+6.69) may be attributed in part to greater disclosure (+3.92) and to a lesser extent to the effects of harmonisation (+2.77).

It is also evident from the indices reported above that within-country comparability continues to be greatly influenced by the clustering of policy choices within countries. A majority of disclosing companies in France, the Netherlands and Sweden used the full provision method (method B) in 1990/91 while all British and Irish companies and

Table 5
Deferred Taxation Comparability Indices

	1986/87	1990/91
Within-country	37.09	37.91
Between-country	10.84	18.61
Total comparability	14.94	21.63

the majority of Swiss companies used the partial provision method (method C). Indeed, within-country comparability remained stable over the period (37.09% in 1986/87 and 37.91% in 1990/91). On the other hand, inter-national, or between-country, comparability increased substantially from 10.84% to 18.61%, due in particular to changes in accounting method by Swedish companies and also to greater disclosure by Swiss and German companies.

Goodwill Arising on Consolidation

Accounting policy issues. For some countries, such as Germany, the Seventh Directive required substantial changes in the method of calculation and the treatment of the difference arising on consolidation. This difference arises in respect of a given participating interest included in a consolidation because the amount ('carrying value') of the asset in the balance sheet of the company holding the participating interest (an asset that is eliminated on consolidation) differs from the amount of the holding company's pro-rata share of the capital and reserves of the company in which the participating interest is held, also eliminated on consolidation.

The Seventh Directive (Articles 19, 30 and 31) requires the 'purchase' or 'acquisition' method of capital consolidation to be used and, in appropriate circumstances, it also permits the 'pooling of interests' or 'merger' method as a member state option. According to the 'purchase' or 'acquisition' method, the consolidation difference is calculated at the date of the acquisition and, as far as possible, is attributed to assets or liabilities that have fair values above or below their book values in the acquired company's accounts, the residual difference being shown in the consolidated balance sheet with an appropriate heading. If positive, the item is to be treated as an asset and amortised through the consolidated profit and loss account according to the rules in the Fourth Directive for 'goodwill acquired for valuable consideration' (see below); alternatively, however, it may be deducted immediately from (or eliminated against) consolidated reserves. If negative, the amount may be trans-

ferred to the consolidated profit and loss account only (a) insofar as it reflects an expectation of future losses or costs, and these losses or costs materialise; or (b) insofar as it corresponds to a realised gain on disposal of relevant assets.

The Fourth Directive (Article 37.2) requires goodwill, to the extent that it was acquired for valuable consideration, to be treated as an asset and amortised through the profit and loss account over a period not exceeding five years; member states, however, may allow systematic amortisation over a longer period provided this does not exceed the economic life of the asset, and this member state option is very widely used.

The rules laid down by the directives had the effect of outlawing a method of capital consolidation previously used, particularly in Germany (and hence known as the 'former German method'). According to this method, there is no assignment of the consolidation difference to assets and liabilities whose fair values differ from their book values in the accounts of the company in which the participation has been acquired. Moreover, the difference is recalculated at each consolidation, and therefore changes as the reserves of the company in which the participation is held change as a result of retained profits or losses. This means that such retained profits and losses are excluded from the group result, which equals that of the parent company.

While the EC directives had the effect of eliminating this method (still used by two German companies in our sample in 1987), they still left room for different interpretations as to the method required. Not merely is considerable flexibility left regarding the disposition of positive goodwill (immediate elimination against reserves, or amortisation through profit and loss account either in the year of acquisition or over an arbitrary number of years supposedly corresponding to its estimated 'economic life'). In addition, the requirements leave open more than one method of calculating the difference arising on first consolidation, namely:

1. The purchase method

This method is known as the 'purchase' method in the US and as the 'acquisition' method in the UK, to distinguish it from the 'pooling of interests' or 'merger' method which is rarely used in Europe. Under the purchase method, all assets and liabilities of the company in which the participation has been acquired are restated to fair values for consolidation purposes. This has the effect that, where there is a minority interest, the minority interest is also restated to reflect the fair values of the attributable share of the net assets. Moreover, where the net assets at fair values exceed the cost of the participating interest, there arises an amount of 'negative goodwill'.⁶

⁶The US version of the purchase method differs in two respects from the UK version in the treatment of negative goodwill. First, in the US version, in the event that the assignable fair values of net assets acquired exceed the cost, the values of non-current assets acquired (excluding long-term investments in marketable securities) should be reduced proportionately. Excess of net assets over cost (negative goodwill) should not be recorded unless the values of all the non-current assets acquired (excluding long-term investments in marketable securities) have been reduced to zero. Second, in the US version, negative goodwill is treated as deferred income (a liability). In the UK version in force at the time of writing, negative goodwill is treated as a component of reserves.

2. The German purchase method (*Neubewertungsmethode in German*)

This is similar to the purchase method described above, except that the restatement of the assets and liabilities is restricted to the amount of the consideration given adjusted for any minority interest, so that no 'negative goodwill' can arise as a result of such restatement.

3. The Book Value method (*Buchwertsmethode in German*)

With this method, the restatement of the assets and liabilities of the company in which the participation has been acquired is restricted to the amount required to make the value of the pro-rata share of its net assets equal to the cost of the investment. There is no restatement of the share of net assets attributable to the minority interest. Moreover, as with the *Neubewertungsmethode*, the assets and liabilities are not restated to an amount in excess of the cost of the investment, so that no 'negative goodwill' can arise as a result of such restatement.

Use of the latter two variants of the 'purchase method' in calculating the difference on first consolidation by companies in our sample was confined (with one exception) to Germany. We had no reason to suppose that the use of these variants produced results materially different from those produced by using the purchase method as applied in the UK or US. Any such differences would hardly be more material than the differences resulting from the use of different 'economic lives'.

National accounting standards and practices. In France, the Decree of 17 February 1986 which implemented the Seventh Directive adopted the 'Anglo-US purchase method'. The elimination of goodwill against reserves is permitted only in exceptional circumstances, rather similar to those in which goodwill may be eliminated against a 'merger reserve' in the UK (see below). In the normal case, goodwill must be shown as an asset and amortised systematically according to a pre-determined plan. In an opinion issued in 1990, the *Conseil National de la Comptabilité* stated that the amortisation period should normally be that over which the original justification for the investment had been calculated, with additional amortisation in exceptional circumstances. In a bulletin issued in January 1988, the *Commission des Opérations de Bourse* laid down a maximum amortisation period of 40 years (the same as in the US).

The situation in Germany following the passage of the 1985 *Bilanzrichtliniengesetz* (which modified the HGB) has already been mentioned above. The provisions concerning consolidated financial statements became applicable for financial years commencing after 31 December 1989, but could be (and in many cases were) adopted earlier. Either the *Buchwertsmethode* or the *Neubewer-*

tungsmethode may be used. In addition, the 'pooling of interests' method is allowed when the (stringently defined) conditions for a merger have been met, but according to a survey carried out by the accounting firm Treuarbeit in 1990, it is virtually never used (Ordeltjeide and Pfaff, 1994). Goodwill may be amortised systematically either over four years or over the 'expected life' (no maximum is laid down). It may also be eliminated against consolidated reserves, though Ordeltjeide and Pfaff note that this is 'contrary to certain basic principles that in Germany have for years applied to the individual [company] accounts ... and was accepted ... only to avoid German enterprises being at a disadvantage in reporting profits' (op. cit. pp. 190–191).

In the Netherlands, according to the Commercial Code, goodwill may be shown as an asset and amortised systematically over its expected economic life, or charged directly to the income statement, or eliminated against reserves (Dijksma and Hoogendoorn, 1993). The 'pooling of interests' method is also allowed, but rarely used. In the case of systematic amortisation, no maximum period is laid down, but an explanation must be provided for the use of any period exceeding five years, and in the case of a permanent decline in value an additional write-off should be made.

In Sweden, the 'purchase' method is normally used; however, during the period of our study, the restatement of assets and liabilities of the acquired company was not required, resulting in a sort of hybrid between the 'purchase' method and the 'former German method'. According to a recommendation of the *Föreningen Auktoriserade Revisorer* (FAR, the Institute of Authorised Auditors), goodwill on consolidation should be systematically amortised to profit and loss over a maximum of 10 years, but this recommendation has not generally been followed. Accounting policies adopted have included amortisation over periods of up to 40 years, and elimination against reserves (Heurlin and Peterssohn, 1992). The 'pooling of interests method' is also permissible in Sweden, but only in cases where the business combination has the characteristics of a genuine merger (e.g., use of share exchange as the consideration, neither of the combining companies to be of dominant size compared to the other, continuity of the combined companies' activities). However, Heurlin and Peterssohn note that the 'pooling of interests method' has been used 'in more cases than would logically follow from the prerequisites indicated above' (op. cit. p. 777).

In the UK, the applicable accounting standards were SSAP 22, *Accounting for Goodwill*, and SSAP 23, *Accounting for Acquisitions and Mergers*. The Companies Act 1985 was also relevant. According to SSAP 22, the preferred treatment of goodwill is

Table 6
Goodwill Cross-classifications

	1986/87						Total	1990/91						Total
	Accounting method					Accounting method								
	A	B	C	D	E	A		B	C	D	E			
Belgium	0	0	0	4	0	4	0	0	0	4	0	4		
France	0	1	0	11	0	12	0	1	0	11	0	12		
Germany	3	10	2	6	1	22	0	11	0	8	3	22		
Ireland	1	2	0	0	1	4	1	2	0	0	1	4		
Netherlands	0	12	0	0	0	12	0	9	0	1	2	12		
Sweden	1	2	0	10	0	13	0	4	0	9	0	13		
Switzerland	0	0	0	2	2	4	0	2	0	2	0	4		
UK	0	15	0	1	2	18	0	15	0	1	2	18		
Total	5	42	2	34	6	89	1	44	0	36	8	89		

Key. A: Written off against profit and loss account in the year of acquisition; B: Eliminated against reserves in the year of acquisition; C: Shown as an asset and not amortised; D: Shown as an asset and amortised through the profit and loss account over more than one year; E: Other or unspecified.

elimination against reserves; systematic amortisation over the expected useful life is also allowed. SSAP 22 does not state a maximum amortisation period. However, the normal maximum of 20 years stated in the Accounting Standards Committee's Exposure Draft ED 47, *Accounting for Goodwill*, (published in February 1990) seems to be rarely exceeded in practice (Archer, Alexander, Collins and Pham, 1995).

At the time of the study, the 'pooling of interests' or 'merger' method was also allowed subject to the conditions laid down in SSAP 23 and the Companies Act 1985 as amended by the Companies Act 1989. In substance, these required that at least 90% of the equity of the 'mergee' company should have been acquired by means of a share exchange (Gordon and Gray, 1994, chapter 9). As an alternative to the 'merger' method, the Companies Act also allows the share premium arising on the shares issued as consideration in a share exchange to be converted into a 'merger reserve'. (With the permission of the courts, even an existing share premium account may be similarly converted.) Goodwill arising on the 'acquisition' may then be eliminated against the 'merger reserve'. The result is similar to what would have been produced by using the 'pooling of interests' method, except that the assets and liabilities of the 'mergee' company would be restated to their fair values.

Classification of accounting policies for goodwill. For the reasons given above, we have used in this paper the following classification of policies in accounting for the difference on first consolidation:

Policy

- A Written off against profit and loss in the year of acquisition;

- B Eliminated against reserves in the year of acquisition;
C Shown as an asset and not amortised;
D Shown as an asset and amortised through the profit and loss account over more than one year;
E Other or unspecified.

For policy B, a variety of different reserves is used, especially by UK companies. However, in view of the different legal status of categories of reserves in the various countries, it did not seem reasonable to treat these differences as different accounting policies.

For policy D, as we have already noted, amortisation periods varied from five years or less, to over 20 years. A number of companies stated that they amortised goodwill 'over one to 20 years'. Again, it did not seem useful to treat the use of different amortisation periods as signifying different accounting policies. In any event, the very notion of 'economic life' for goodwill is problematic.

Analysis of goodwill accounting policy choices. The cross-classification of goodwill accounting methods used is given in Table 6.

There was little change overall. Two German companies, which in 1986/87 were still using the method formerly adopted in Germany (method C, shown as an asset and not amortised) abandoned that practice at a later date. Thus, given that there is no basis on which to consider method C as equiprobable, we may consider the choice to be between the three main alternative methods. Therefore, if there had been full disclosure, the minimum level of comparability would have been approximately 33% in 1990/91. However, in view of the level of disclosure observed (81 out of 89 companies choosing between the three main methods in both periods, and two companies

Table 7
Goodwill Comparability Indices

	1986/87	1990/91
Within-country	58.17	53.92
Between-country	34.66	37.71
Total comparability	38.33	40.25

capitalising goodwill without subsequent amortisation in the first period), the effective overall minimum level of comparability was 27% in both 1986/87 and 1990/91. Non-disclosure was not a particularly serious problem in the case of goodwill.

As shown in Table 7, there was a slight increase overall in the level of comparability between 1986/87 and 1990/91, from 38.33% to 40%. In both periods, this is greater than the minimum level that would have been observed if companies had selected their policies at random, and it may be inferred that an important degree of harmony was already in existence by 1986/87 with respect to goodwill. The results also demonstrate the effect that occurs when a relatively small number of companies switch from a minority practice to a more generally accepted practice (or vice versa), resulting in substantial increases (or decreases) in the number of pairwise comparisons. For instance, the decision by a small number of German companies to abandon the minority practices of either writing off against profit in the year of acquisition (method A) or showing as an unamortised asset (method C), and to adopt one of two more generally accepted practices (method B or method D), had a positive effect on comparability, particularly on inter-national, or between-country, comparability. The between-country index increased from 34.66% to 37.71%. On the other hand, the decision by a small number of Dutch companies which followed generally accepted Dutch practice (method B) in 1986/87 either to switch to another method that is generally accepted in several countries other than the Netherlands (method D) or to not specify the method used in their 1990/91 financial statements led to an overall decrease in within-country comparability. The within-country comparability index fell from 58.17% to 53.92%.

Summary and conclusions

The C (comparability) index developed by van der Tas may be used, with some restrictions, as a measure of the state of accounting harmony prevailing in a sample of companies with respect to a single financial statement item. It follows that the change in the value of the comparability index over a period of time is likewise a measure of the process of accounting harmonisation in the treatment of that item. However, we show that the C index is

deficient in that it is insensitive to the interactions between intra-national and inter-national trends in accounting policy choice, and therefore is an imperfect measure of *international* harmonisation.

In this paper, we have as a first step developed the comparability index further by decomposing it formally into its within-country (intra-national) and its between-country (inter-national) components, whereas van der Tas (1988) calculated a separate I index for the latter.

With regard to the measures of the processes of harmonisation over the four-year period for deferred tax and goodwill, the following results of our analysis are worthy of mention.

Deferred Tax

The total comparability index for the eight-country sample (Belgium, France, Germany, Ireland, the Netherlands, Sweden, Switzerland and the UK) increased from 14.94 to 21.63, still a very low level of harmony. As within-country comparability remained fairly low and showed no significant increase over 1986/87, the increase in overall comparability was almost entirely attributable to an increase in between-country comparability. This was due in part to the choice by most Swedish companies to abandon the taxes payable method in favour (insofar as disclosure allowed us to determine) of the full provision method of deferred tax accounting. It was also due in part to fuller disclosure of the methods used in other countries.

The area of deferred tax is one where no standardisation was (or could readily have been) attempted in the Fourth Directive, national practices reflecting the divergences in the relationships between accounting for tax and for financial reporting. Where tax allowances, to be claimed, must be 'booked' for financial reporting purposes, there is no need for deferred tax accounting. Consequently, in countries where that is the case, there is typically no comprehensive national standard for deferred tax. Multinational groups with their holding company in such countries and subsidiaries in foreign countries are therefore left with various choices as to how the group deferred tax position is to be accounted for. This is reflected in turn in the diversity of accounting practices that we have observed, and, in spite of some discernible harmonisation effects during the period, in the relatively low level of comparability of financial statements with respect to deferred tax accounting.

Goodwill Arising on Consolidation

The total comparability index for the eight countries showed no significant increase (1986/87: 38.33; 1990/91: 40.25). As regards the levels of within-country and between-country comparability, the former actually decreased while the latter increased. Of the 89 sample companies, all but 11 in 1986/87 and nine in 1990/91 were divided into

two groups of similar size: those which chose to eliminate goodwill against reserves, and those which treated goodwill as an asset to be amortised through the profit and loss account over its 'useful economic life'. This division did not change significantly over the four-year period, and reflects the options left by the Seventh Directive and also by IAS 22 prior to its revision.

The analysis of the sample data thus suggests that, for very large companies, the impact of the Seventh Directive had already taken place by 1986/87. For example, only two German companies were still using the 'former German method' at that time, although the 1985 *Bilanzrichtliniengesetz* permitted the continued use of the method during a transitional period ending in 1990. This suggests that almost all the large German groups in the sample decided to abandon a method that was not internationally recognised, in an area that had no German tax implications. Also, in 1986/87 the previously illegal practice of eliminating goodwill against reserves was already the most frequently used method in Germany, thanks to early adoption of the provisions of the 1985 Law; by 1990/91, only one further company was using the method.

Conclusions

Our analysis indicates that, in the two areas of deferred taxation and consolidated goodwill, little progress in harmonisation took place between 1986/87 and 1990/91, but that such progress as there was can be attributed to increases in between-country comparability, since the change in within-country comparability was either very small or negative.

The EC Directives have brought about a significant amount of *rapprochement* of national accounting standards in Europe, not just in the member states but also in potential member states and other countries having close links with the EU. However, both deferred taxation and consolidated goodwill are areas where the EC directives left considerable latitude to member states, and where national standards have continued in some cases to be somewhat flexible. Moreover, the German companies in our sample had mostly chosen to adopt the provisions of the 1985 Law well in advance of the deadline.

Van der Tas (1992a) distinguished between the international harmonisation of accounting standards ('formal' harmonisation) and of accounting practices ('substantive' harmonisation). Obviously, the distinction is important, not least because the harmonisation of national standards across countries is one of the major factors affecting the international harmonisation of practices.

The process of 'substantive' harmonisation in a population of multinational companies is, however, likely to be influenced by other factors, such as IASs and US GAAP, insofar as these are internationally recognised and the benefits of adopting internationally recognised accounting methods are seen to exceed the costs. Such factors may have an influence on a substantial part, but far from all, of the sub-population of companies in a country, leading to a decrease in the level of national (within-country) harmony in that country. This, in turn, may offset the effects (in terms of international comparability) of an increase in between-country harmony. Therefore, to have an understanding of the processes of harmonisation, we believe that it is crucial to be able to identify, as we have done here, the different impacts of changes in comparability at the within-country and the between-country levels.

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Creative Accounting and Investment Analyst Response

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Abstract—This paper investigates the impact of window dressing on stockbroker analyst evaluation of a company's annual accounting numbers. A new methodological approach is used involving a laboratory experiment in which a large sample of experienced investment analysts drawn from five of the top London houses processes real company accounts. The research was conducted in the first half of 1990 at the end of a long bull market. The participating analysts were not overly concerned about the quality of published accounting information and creative accounting was not then viewed as a serious problem. Contrary to our prior expectations we found little evidence of window dressing adjustments being made by the subjects in general. However, those subjects who did correct were significantly more experienced. Possible explanations for our results and potential implications for capital market behaviour and information processing are discussed.

Introduction

There are two principal competing hypotheses relating to capital market information processing (Foster, 1986, chapter 11; Watts and Zimmerman, 1986, chapter 4). The 'mechanistic' or 'naive investor' hypothesis questions the capacity of market participants correctly to interpret financial information. Such naive investors are viewed as fixated on reported accounting numbers independent of accounting methods used (Hand, 1990; Belkaoui, 1992; but see Tinic, 1990). According to this perspective, investment analysts play a major role in correctly interpreting such information and keeping the market efficient.

A potential consequence of the Efficient Market Hypothesis (EMH), on the other hand, is that only information relating to changes in expected cash flows is price sensitive and that accounting methods are irrelevant. Investment analysts, in this model, equally have a role in enhancing market efficiency through improving information flows (Foster, 1986; Cohen et al., 1987). Both paradigms place the investment analyst in a pre-eminent position.

This research study seeks to investigate the effect of window dressing of published financial statements on stockbroking analysts' evaluations of company accounts numbers and explores implications for market behaviour.

Whereas there is a voluminous literature exploring the relationship between accounting information

and stock prices in general,¹ appropriate research methodologies for measuring creative accounting and assessing its impact on investor behaviour are lacking.

This research makes use of a new methodology complementary to those used by Arnold and Moizer (1984), Day (1986) and Gniewosz (1990) to investigate the behaviour of financial analysts, and in the income smoothing literature (e.g., Eckel, 1981; Brayshaw and Eldin, 1989).

The study reports on a laboratory experiment with 63 experienced stockbroking analysts drawn from five of the top London houses, conducted between February and June 1990 before the onset of the UK recession. Participants process sets of window dressed accounts and, inter alia, adjust their ratio calculations for such creative accounting.² Contrary to our priors, the number of adjustments made is not significant. The results are both of interest in their own right and have implications for theory, although further work is necessary to ensure they are not time and environment specific.

The next section discusses research issues of relevance to this study and the following one establishes our hypotheses in detail. Next, the research methodology is outlined and the sample data described; the empirical results follow. A discussion section completes the paper.

¹See, for example, the special Capital Markets issue of the *Journal of Accounting and Economics*, Vol. 15, nos. 2/3, 1992, pp. 119-442 and the Forum on Accounting Disclosures and Stock Prices in *The Accounting Review*, Vol. 66, no. 1, 1991, pp. 23-79, for some recent work.

²In line with Naser (1993, p. 2 and p. 59) 'creative accounting' is used as a generic term and 'window dressing' for those creative accounting techniques that are detectable. See also Parker (1992, p. 76 and p. 302).

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Research background

Independent of market behaviour hypothesis, investment analysts are attributed a key role in the process of information circulation and price setting.³

The mechanistic or naive investor hypothesis argues that investors can experience problems in decoding financial information and therefore there is always the potential for them to be misled by accounting manipulations (Lee and Tweedie, 1977 and 1981). To assure informational efficiency in such an environment, investment analysts must ensure the rapid transmission and accurate interpretation of financial information.

In the context of the EMH there is substantial empirical evidence suggesting the existence of differential informational efficiency associated with level of investor interest. Analyst following is highly correlated with the level of information available to the market about the firm (O'Brien and Bhushan, 1990; Bhushan, 1989). Actively followed firms, which generally tend to be large (Collins et al., 1987), exhibit substantially lower levels of price reaction to 'unexpected' events (Freeman, 1987; Foster et al., 1984). Investment analyst activity is key to efficient price setting.⁴

However, despite their importance, we know little about the way investment analysts process information generally and, in particular, that taken from companies' published accounts.

Fundamental analysis is the method most widely used by analysts in both the US and UK (Arnold et al., 1984; Arnold and Moizer, 1984). The manner in which this is typically conducted requires, following Arnold and Moizer (1984), an estimation of earnings for the current year and an application to this number of a subjectively determined price-earnings ratio (PER) to obtain an appropriate 'intrinsic' market price.

To determine an appropriate PER, the strength of the balance sheet is assessed, with particular emphasis given to the company's liquidity position and gearing ratio, and a view is taken on the quality of earnings. Good quality earnings are manifested by a stable rate of growth in EPS over time, implying a lower level of risk.

An analyst's view on a company at any one point in time is the result of a long and complex process of gathering and evaluating information from many sources. Analysts will typically be heavily reliant on soft, informal sources of information such as that derived from company con-

tacts and visits, and use more timely interim and preliminary statement numbers in coming to a judgment on a firm.

However, published accounts are a key source of information and this finding is uniform across markets and through time (e.g., Lee and Tweedie, 1981; Hines, 1982; Chang et al., 1983; Arnold et al., 1984; Day, 1986; Gniewosz, 1990; Vergoossen, 1993 and Pike et al., 1993).

Such importance is apparently due not only to what is termed their confirmatory or corroborative use vis à vis the preliminary statement and other information, but also their potential to convey new information (Rippington and Taffler, 1994). This may be both in regard to risk, e.g., via the balance sheet, and from operations (Hines, 1982). In addition, the annual report and accounts provides the only information about the firm that is independently audited, and it constitutes the physical repository of a wide range of general information collected in one place.

However, the annual accounts can be flattered. Creative accounting is widely believed to exist and to influence investor behaviour (e.g., Griffiths, 1986; Jameson, 1988; Tweedie and Whittington, 1990; Mathews and Perera, 1991, chapter 13; Smith, 1992; and Naser, 1993). Nonetheless, there is little academic research that tests this belief explicitly and explores whether market participants are able to see through such accounting manipulations. This is the purpose of this study.

According to Jameson (1988, p. 20):

'Creative accounting is not against the law. It operates within the letter both of the law and of accounting standards but it is quite clearly against the spirit of both. . . . It is essentially a process of using the rules, the flexibility provided by them and the omissions within them, to make financial statements look somewhat different from what was intended by the rule. It consists of rule-bending and loophole-seeking.'⁵

For our purposes, we define window dressing to be the result of the exercise by management of choices among different accounting principles or presentation methods with a view to misleading users of published accounts. *The window dressed accounts still comply with the letter of the law and accounting standards, although not necessarily their spirit.*⁶

³We distinguish here, as with Moizer and Arnold (1984), between investment analysts qua portfolio managers and investment analysts qua information intermediaries. This study exclusively focuses on the latter.

⁴The information intermediary may also have an important role in reducing information asymmetry between firm management and actual and potential investors within an agency theory context (Moizer and Arnold, 1984).

⁵Naser (1993, p. 59) has a similar definition.

⁶The term window dressing can also be used to refer to the practice of entering into 'real' transactions to manipulate primary accounting data (Parker, 1992, p. 302). Such an act might be delaying payments to creditors at the year end date, although inevitably, the results of such practices are often invisible to accounts users (Davies et al., 1992, pp. 1,177-78). See also Naser (1993, chapter 12) and Mathews and Perera (1991, chapter 13).

Hypotheses

This research is in the tradition of Lee and Tweedie (1981) into the ability of market participants to interpret financial accounting information. The specific question we are concerned with is what do stockbroking analysts do when financial statements are window dressed? This requires a higher degree of understanding of accounting issues than that tested for in Lee and Tweedie.

In the EMH environment, investment analysts are expected to correct for creative accounting where window dressed items impact on their forecasts of future cash flows.⁷ According to the mechanistic hypothesis, such analysts need to be experts in decoding financial information and, as accounting numbers are supposed to have an effect on share prices, they will also be expected to correct adequately for window dressing.

Our first hypothesis relates to the ability of investment analysts to recognise and take into account window dressing in the accounts of companies they are evaluating.

Hypothesis 1: Stockbroking analysts will correct for window dressed items in the annual accounts.

Because we would expect analysts to correct differentially depending on whether they are specifically alerted to the presence of window dressed figures in a set of accounts or not, we also explicitly test for this.

In addition two secondary hypotheses are examined. The second hypothesis relates to potential differences in detection rates for different window dressed items. Generally, we would expect more complex schemes to be less readily identified and corrected for.

Different window dressing schemes do not have the same visibility (Craig and Walsh, 1989). As an example, a misclassified extraordinary item may be easy to identify while, at the other end of the scale, off balance sheet financing schemes may be very hard to find, precisely because they are kept off balance sheet.⁸

Hypothesis 2: Different window dressed items will not be discovered with the same relative frequency.

Window dressing recognition may be mainly a question of practice. Therefore, for example, we would expect more experienced analysts to be more skilled in this very practical activity. The third hypothesis tests this explicitly.

Hypothesis 3: There will be a positive relationship between correction rates and analyst experience levels.

We also would expect those having less confidence in financial statement information, or viewing creative accounting as a more serious problem, to be more likely to pick up window dressing schemes.

Research approach

This study is concerned with the ability of stockbroking analysts to recognise and deal with creative accounting.

Questionnaire-based methodology for such types of investigation is likely to be problematic through potential sample selection or response bias, conflicting answers that may be difficult to interpret and such factors as misunderstanding or desire to 'please' the researcher (Hines, 1982). Because of this, previous researchers have adopted alternative methodologies such as protocol analysis (Biggs, 1984; Day, 1986; Bouwman et al., 1987), content analysis (Govindarajan, 1980) or direct observation (Gniewosz, 1990). However, such approaches, which are highly researcher time intensive, constrain the sample size and do not allow for the manipulation of instrumental variables.

We adopt here a case study based experimental approach that overcomes many of the problems discussed above. The case study was developed from the 1987 financial statements of Dawson International and John Laing with all identifying information removed.⁹ The two companies were selected, *inter alia*, as having accounts clean of the nine key creative accounting schemes which are the subject of this investigation. One set of accounts (John Laing) was left unchanged, to serve as a control, and the other was manipulated to contain different combinations of the nine window dressed schemes,¹⁰ mostly four in number, to permit the explicit testing of Hypothesis 2 relating to differential item correction rates.

Appendix 2 details the experimental design which also had as its purpose the determination of which schemes were more or less detectable.¹¹

⁹The material encompasses the directors' report, accounts and all footnotes. Biggs (1984) does not provide footnotes to his participating analysts on the basis this would make the research task too long. However, excluding such notes would render the experiment meaningless as clues to the existence of window dressing are located here. Bouwman et al. (1987) argue that professional analysts are able to process a great quantity of information within a limited period of time. They provide their subjects with complete sets of financial statements plus other information in an experimental task lasting between 19 and 80 minutes with mean 52 minutes.

¹⁰All are taken directly from other published company accounts and are discussed below.

¹¹The authors are indebted to Dr Lynda White of the Department of Mathematics at Imperial College, London, for assisting with the design of this experiment.

⁷In practice these are usually proxied by earnings forecasts.

⁸Clearly, if creative accounting schemes are not disclosed anywhere in the accounts, the probability that even the skilled analyst would be aware of their financial implications is low.

Table 1
Window Dressing Schemes

<i>T&W</i>	<i>Smith</i>	
		1. Deferred taxation
	x	2. Pension contribution holiday
	x	3. Extraordinary items
	x	4. Creating profit via asset disposal
x		5. Merger accounting
x	x	6. Non-subsidiary subsidiaries
x		7. Non-capitalisation of leased assets
x		8. Hidden interest charges
x	x	9. Non-consolidated subsidiaries

Five of our schemes (2, 3, 4, 6 and 9) overlap with those discussed in Smith (1992). Five also (5, 6, 7, 8 and 9) are similarly discussed in Tweedie and Whittington (1990). Since the experiment was designed, several of these issues have been or are being addressed by the Accounting Standards Board and previously the Accounting Standards Committee.

The case studies were administered to 63 experienced stockbroking analysts under controlled conditions who, after completing and handing in the main task, filled in a short personal questionnaire.

The research instrument was designed to simulate the type of work an investment analyst might do in analysing a set of financial statements and verisimilitude was enhanced by the use of actual company accounts and window dressing schemes. A suitable list of these was developed in three stages. First, the professional literature including several years of the Institute of Chartered Accountants in England and Wales' *Survey of Published Accounts* was consulted to identify a long list of potential areas to include in the research instrument. Second, five of the then Big Eight senior technical partners were consulted regarding the relative importance and representativeness of different schemes, their transparency and experimental tractability. On the basis of these discussions the nine schemes listed in Table 1 were retained for the research instrument. Appendix 1 describes these in more detail. Third, a random sample of 50 of the largest 250 fully listed industrial companies was drawn from the 1987-88 *Times 1000* publication and the two most recent sets of financial statements for each company examined in detail for examples of creative accounting. Representative schemes were selected under each of the nine headings in Table 1 to be incorporated appropriately in the research instrument.¹²

The objective of the experiment was to explore how investment analysts would adjust published

accounting numbers for window dressing. To evaluate this, the case study required participating analysts to calculate a number of familiar financial ratios.

Financial ratios are a basic tool of financial analysis and are familiar to and widely used by stockbroking analysts (Foster, 1986; Cohen et al., 1987; Bouwman et al., 1987; Rees, 1990). Asking analysts to conduct such calculations added to the realism of the task and allowed us to measure their behaviour in practice.

The main task consisted of the participating stockbroking analysts calculating seven standard ratios for each of the two companies using numbers taken from the accounts in the way each subject wanted, in order to produce the most relevant results for him or her. Table 2 lists the ratios used. The choice was made both to ensure coverage of key accounting items potentially amenable to window dressing and analyst familiarity.¹³

The research instrument was initially pre-tested on investment analysts in a major fund management institution and modified slightly in the light of the results. The principal experiment was conducted with the collaboration of the heads of research of five of the largest City-based stockbroking firms to whom the authors are indebted for their involvement and interest. Participating analysts were nominated by their respective heads of research as of high calibre, specialising in UK industrial companies and having a minimum of two years' direct experience. Different firms contributed from nine to 16 subjects, totalling 63 in all.

¹²Of the 100 sets of accounts, 79 had at least one readily identifiable such scheme.

¹³The ratios are all widely used by investment analysts (Foster, 1986, pp. 77-79) and viewed as key in all basic financial analysis texts (e.g., Holmes and Sugden, 1990; Rees, 1990).

Table 2
Ratios Calculated by Stockbroking Analysts

1. Sales margin (operating profit)
2. Return on equity
3. Return on total assets
4. Price/earnings ratio
5. Gearing
6. Liquidity ratio (acid test)
7. Book value of net assets per share

The experiment was conducted on each stockbroking firm's premises and lasted for a minimum of one hour, with all subjects completing the experimental materials at the same time in the same room supervised by the researchers.¹⁴

To test whether directly alerting analysts to the presence of window dressing in the accounts they were analysing led to an increased correction rate, participants were divided into two groups in each firm, an experimental group and a control group. Both groups were told the study was concerned with the financial information needs of stockbroking analysts and that the researchers wanted to see how they modified the numbers appearing in company accounts in their normal company assessment task. The control group, in addition, however, was explicitly informed that we were interested in window dressing occurring in financial statements and the way in which they dealt with this when they evaluated a company.

Our first hypothesis, relating to the ability of financial analysts to recognise and correct for window dressing in financial statements, is tested by examining the individual accounting numbers used by the participants to calculate the seven ratios.

The second hypothesis, which is concerned with the differences in detection rates related to different window dressing schemes, is investigated using the results obtained in testing Hypothesis 1 in accordance with the schema in Appendix 2.

Hypothesis 3, relating to the impact of experience on analyst behaviour, is tested by comparing mean years' experience across separate groups of correctors, i.e., those participants making at least one valid adjustment for window dressing, and non-correctors, those making none at all, with years of experience obtained from the accompanying personal questionnaire. This questionnaire first requests information on the age, number of years of experience and number of companies followed

Table 3
Rates of Correction

	<i>n</i>	<i>Mean (%)</i>
Total sample	63	3.1
Experimental group	35	2.8
Control group	28	3.3

by the analyst, their sectors of specialism and educational background.¹⁵ Analysts are then asked to state their degree of confidence in the reliability of financial statement information, how importantly they view window dressing, if they had noticed some window dressed items in the case study material, and how this had changed the way they had calculated their ratios. Finally, the subjects are asked to rank different sources of information in descending order of importance to them in their day-to-day work.

Empirical results

Hypothesis 1: Propensity to Correct

Table 3 shows that the overall rate of correction is very low at 3.05%.¹⁶ The equivalent rates for the experimental and control groups, 2.8% and 3.3% respectively, do not differ significantly.¹⁷

These results indicate that the participating analysts did not correct in a material way for window dressed items in the research instrument and Hypothesis 1 is rejected.¹⁸ In addition, alerting analysts to the presence of window dressing did not lead to any significant increase in correction rates.

These conclusions, however, are not due to inability of the subjects to define and thus calculate the ratios involved in the experiment meaningfully. Table 4 provides the mean percentages of correct ratio definitions for the seven measures¹⁹ and the

¹⁵The average age of the sample was 31.6 years (s.d. 6.7), mean years of working as an analyst 5.3 (s.d. 4.2) and average number of companies followed 19.1 (s.d. 4.8). The range of sectors covered, as expected, was diverse as were educational backgrounds which included three PhDs. There were seven qualified accountants in the sample, and a further 18 participants stated they had taken degrees or other courses with a significant accounting component.

¹⁶In total the 63 analysts could have made around 853 possible corrections; only 26 accounting numbers were adjusted. The equivalent results for the experimental and control groups were 13/460 and 13/393 respectively.

¹⁷ $Z_{calc} = 0.42$ using the standard test of difference in sample proportions.

¹⁸Strictly speaking, Hypothesis 1 requires a comparison of actual correction rate with an appropriate norm. Based on the results of Table 3, using the normal approximation to the binomial distribution, we can be 99% confident that the overall 3.1% correction rate is below any required norm of 4.4% or above.

¹⁹The researchers classed as correct any generally accepted definition appearing in the literature or logically consistent and meaningful measure, under each ratio heading.

¹⁴Two firms were visited in February, two in March and the last in June 1990. Mean task completion time was 53 minutes with a range of 35 to 80 minutes. The researchers were both present throughout the experiment and no discussion or contact between participants was allowed.

Table 4
Percentages of Correct Ratio Definitions

Description	Rate of success %
Price/earnings ratio	99
Sales margin	94
Gearing ratio	89
Return on equity	79
Book value of net assets per share	70
Return on total assets	66
Liquidity ratio	60
Average:	81

overall success rate of 81% suggests a good degree of skill and ability at this task. However, the range in performance is wide, from near 100% for the key price/earnings ratio, down to only 60% for the liquidity ratio.²⁰

Hypothesis 2: Differences in Detection Rates

Three window dressing schemes had correction rates, albeit not high, significantly different to zero—viz: Scheme 3, extraordinary items, at 5.4%; Scheme 4, creating profit via asset disposal, at 8.6%; and Scheme 9, non-consolidated subsidiaries, at 6.7%.²¹ Of the other six schemes, five received no corrections at all and the sixth, only one. A priori, abuse of the extraordinary item classification is the most transparent window dressing scheme of the nine in Table 3 and adjusting for profits taken on asset sales may reflect the manner in which analysts tend to work with normalised profits. The third scheme, non-consolidated subsidiaries, relates primarily to the use of off balance sheet debt.

Nonetheless, the low overall rates of correction do not allow any firm conclusions to be drawn about different discovery rates between schemes.

Hypothesis 3: Correction Rates and Analyst Experience

Formal statistical tests of differences in the biographical characteristics of the participating analysts across the five stockbroking houses and

for the experimental and control groups separately, both within firms and across the whole sample, did not allow the rejection of sample homogeneity on any characteristic at $\alpha = 0.05$. As such we pool our sample cases in subsequent analysis.

Because of the small number of corrections made to test for the posited relationship between correction ratio and years of experience, the sample is split into those 11 analysts making at least one correction and the 52 non-correctors, and their experience levels compared. Table 5 provides the results and also equivalent information on age and number of companies followed as potential confounding factors.

The only significant difference between the two groups, and that at better than $\alpha = 0.01$,²² is in number of years of experience, with mean of 10.1 years for correctors and only 4.4 years for the non-correctors, thus supporting Hypothesis 3. Interestingly enough, none of the seven qualified accountants in the sample made any corrections for window dressing.

The questionnaire also sought analyst views on the quality of accounting information provided by firms in general and how they dealt with window dressed items present in the case study.

An interesting, even if surprising, result related to the relationship between answers in the questionnaire to the questions concerning recognition of window dressing in the accounts provided, and the corrections analysts believed they had made. Table 6 summarises the answers to both questions with a breakdown for the experimental and control groups separately.

Two thirds of the subjects stated they had seen window dressed items in their case study material and, more surprising, 61% believed such recognition changed the way they had calculated their ratios.

We can easily accept that more window dressed items were recognised than those for which corrections were made.²³ However, we are forced to doubt that 67% of participants had really observed the presence of window dressed items in their case study material.

There is a significant difference between correctors and non-correctors in the way they answered these two questions. All the 11 analysts making corrections declared they had noticed some window dressed items and 91% (10 out of 11) of them indicated that it had changed their ratio calculations. Sixty per cent of the non-correctors

²⁰Table 4 suggests that analysts may generally be better at handling profit based ratios than balance sheet measures reflecting perhaps what they consider to be more important. A number of the subjects, in fact, admitted to not being able to define a liquidity ratio implying perhaps that the short-term liquidity position of a company may not be very important for them when assessing its potential.

²¹The actual correction rates were 6/111, 12/139 and 7/104. Using the standard binominal test $Z_{calc} = 2.5, 3.6$ and 2.7 , respectively, all significant at the 1% level (one-tail test).

²² $t_{calc} = 4.5$.

²³This is corroborated by examples given by participants in the margin to their answer to this question. An additional 10 schemes present in the case study were correctly identified by eight participants but not corrected for. However, we are not able to use such margin entries to generalise about the degree of recognition but non-correction because of the voluntary disclosure basis.

Table 5
Personal Characteristics of Correctors Versus Non-Correctors

	<i>Correctors</i> (<i>n</i> = 11)		<i>Non-correctors</i> (<i>n</i> = 52)	
	<i>Mean</i>	<i>St. dev.</i>	<i>Mean</i>	<i>St. dev.</i>
Experience (years)	10.1	7.5	4.4	2.5
Age	33.2	7.6	31.8	6.6
No. of companies followed	20.7	10.2	18.7	9.7

believed they had picked up window dressing and 52% that they had corrected for this.

Confidence in Financial Statement Information

The questionnaire also asked the analysts about their degree of confidence in financial statements and how seriously they viewed the problem of window dressing. Table 7 reports the scores on these two somewhat related questions. For confidence in financial statements, the scale goes from 1 = total confidence to 6 = no confidence and for the seriousness of window dressing the scale goes from 1 = very serious to 6 = not serious at all.

Table 7 shows a high degree of centrality in the answers given. There were no significant differences between firms in general on these questions and more importantly, and contrary to our expectations, no significant differences between the 11 correctors and 52 non-correctors. These results might simply suggest that at the time of the study, analysts were reasonably confident about the accuracy etc. of financial statements and not too worried about window dressing. However, the high degree of centrality and low standard deviations of the responses would also be consistent with a general lack of interest in and of concern about such issues.

Information Sources

The questionnaire finally asked the respondents to rank the information sources they used in making an investment recommendation, in order of descending importance. There was a high degree of homogeneity across firms in terms of average response and, more importantly, with previous UK-based academic research. Table 8 provides the

average rankings for our overall sample compared with equivalent rankings provided by other studies, appropriately amended for comparison purposes. There is a good degree of consistency in the ranking of information sources across Table 8, which increases the confidence we can have in our results.²⁴

Taking the results of Table 8 at face value, we must conclude that financial statements are very relevant for investment analysts, and therefore that it is important to study the quality of the information they contain and analyst reaction.

Discussion

Window dressing correction rates in our study are very low. Therefore, our principal null hypothesis that analysts do correct appropriately for window dressing cannot be supported by our results. Taken at face value these suggest that stockbroking analysts do not adjust their financial analysis directly to take into account creative accounting in financial statements.

However, as we have some indication that analysts may have seen more schemes than they had corrected for, it may not be their ability to pick up window dressed items that is necessarily in question, but their subsequent actions.

We submitted our results to the heads of research in the five participating firms. They were not very surprised by our results. Two explanations were given. First, the level of financial analysis expertise of certain of their younger analysts may have been below that desired, reflecting the existence of a bull market for most of their working life when it was not necessary to investigate company finances very deeply.²⁵ As one research director put it: 'In a bull market the job of an analyst is to sell shares and window dressing is not important. In a

Table 6
Window Dressing Noticed and Perceived Corrections Made (% of Analysts Answering 'Yes')

	<i>n</i>	<i>Noticed (%)</i>	<i>Perceived corrections made (%)</i>
Overall sample	63	67	61
Experimental group	35	68	61
Control group	28	65	60

²⁴Arnold and Moizer (1984, p. 203) suggest their unexpectedly low ranking for direct company contacts and visits may not reflect their importance in reality. Pike et al. (1993) suggest their comparative results reflect changes in the market environment in recent years.

²⁵This is consistent with our finding that those investment analysts who had made at least one correction had mean experience of 10.1 years, while those who had not only had an average of 4.4 years.

Table 7
Confidence in Financial Statements and Seriousness of Window Dressing

	<i>n</i>	<i>Confidence</i>		<i>Seriousness</i>	
		<i>Mean</i>	<i>St. dev.</i>	<i>Mean</i>	<i>St. dev.</i>
Overall sample	63	3.1	1.0	3.1	1.3
Experimental group	35	3.1	1.2	3.0	1.3
Control group	28	3.1	0.8	3.2	1.3

Table 8
Ranking of Importance for Sources of Information

	<i>ALL</i>	<i>LT</i>	<i>CMB</i>	<i>AM</i>	<i>HBW</i>	<i>PMC</i>
Direct company contacts and visits	1	3	1	3	2 =	1
Preliminary announcements and annual accounting statements*	2	1	2	1	1	3
Interim statements	3	2	3	2	2 =	2
Previous work and market data already collected	4	—	—	—	—	—
Annual report content other than financial statements	5	5	—	4	—	—
Trade journals and newspapers	6	4	4	5	5	4
Statistical/macroeconomic forecasts	7	6	—	6	—	—
Subsidiaries' accounts	8	—	—	—	—	—
Companies' PR/press reports	9	—	5	—	4	—
Chart services	10	—	6	—	6	—
Other brokers' circulars	11	—	—	7	7	5

Key: ALL = average ranking across all subjects in our sample

LT = Lee and Tweedie (1981)

CMB = Chang, Most and Brain (1983, Table 5)

AM = Arnold and Moizer (1984)

HBW = Hussey, Bence and Wilkie (1992, Table 3.1)

PMC = Pike, Meerjanssen and Chadwick (1993)

*Preliminary announcements and annual accounting statements were separate items in our questionnaire. Our analysts consistently ranked these one after the other in second and third place. To render our results compatible with those of the other researchers the two items are amalgamated.

bear market detailed financial analysis becomes very important indeed.'

The research directors also pointed out that an analyst's (valid) reaction, when facing window dressed financial statements, may not be to correct their forecasts but to call the financial director to seek an explanation. They may also have to protect their principal source of information, company contacts, so they are very careful before drawing attention to and correcting for creative accounting in print.

We should also note that stockbroking firms are competing in the information market and must thus respond to the demands of their clients, principally institutional investors. To a great extent investment analyst performance is evaluated by the accuracy of their forecasts. This accuracy is not judged by their forecasts of what might be termed

'real' profit but the presented profit. This gives analysts a great incentive to forecast the window dressed profit. At least when the research was conducted, there was no market for creative accounting adjustments.

This study took place in the first half of 1990 before the recession had fully started to impact. It may be that, now, stockbroking analysts view financial analysis as of more fundamental importance and were we to repeat our research our conclusions would be very different.²⁶

In a bull market and a growing economy, window dressing may not matter as much. However, in a bear market and an economic recession, with

²⁶In fact, soon after we reported our results to the participating firms, at least three instituted rigorous revision courses in financial analysis for all their analysts.

companies experiencing trading difficulties, profit collapses and financing problems, it is crucial for investors to understand the firm's true financial risk. Also, stockbroking firms have a greater incentive to invest in high quality financial analysis because of the ready market for such information.²⁷

Other issues relate to the nature of the experiment itself:

1. The experiment was conducted within time constraints, which may, potentially, have hindered participating analysts from completing the task fully.²⁸ Nonetheless, the very low correction rate raises doubts as to whether more time would have provided better results.

2. Participating analysts may not have read the instructions, relying on the introductory verbal presentation alone, and then not have picked up what the experiment was about. However, the verbal presentation, even if not mentioning the words window dressing directly, which appeared only in the control group's instructions, insisted on the fact that the research was specifically about the way analysts manipulated accounting numbers taken from published accounts to suit their particular needs.

3. Potential lack of motivation of participants and consequent lack of interest in the task. However, in each firm the researchers were personally introduced to the analysts by the relevant head of research who stressed the importance of the research, his own interest in it, and that their results would be reported to him. Direct observation of the subjects during the experimental task also suggested they were treating this exercise in a serious and careful manner.

4. Potential lack of verisimilitude of the case studies. However, it would be difficult, in practical terms, to envisage any more realistic research instrument than real accounts with instructions to participants '...to calculate seven widely used accounting ratios in the same way you would normally do if you were preparing a report on a company for clients.'

Thus we believe that although such factors as the above could potentially have lowered the correction rate, it is necessary to look beyond exper-

imental issues alone to explain such a low rate overall.²⁹

Taken at face value our results suggest that, at least when the research was conducted, stockbroking analysts, in general, were not dealing appropriately with creative accounting in published accounts. The naive investor hypothesis has a requirement for skilled information intermediaries to process accounting information. If, however, such investment analysts are also functionally fixated on the presented numbers, then we must question the mechanism by which window dressed accounts are evaluated by the stock market.

However, providing there are still sufficient 'informed investors' able to decode such creative accounting and 'uninformed' investors are unbiased in their trading behaviour, then the market may still be informationally efficient (e.g., Tinic, 1990). Only a small number of accounting experts may be required for the market as a whole appropriately to process window dressed numbers.

An alternative explanation is that accounting information may not be very important to market participants, and in particular information intermediaries, who may prefer to work with more timely and softer information sources in forecasting cash flows and intrinsic value. In this case we would expect little attention to be paid to a firm's accounting numbers. However, Table 8 shows the firm's annual accounting disclosures to be ranked second, below direct company contacts and visits, in order of importance.

We should, however, note that our findings need to be replicated for different time periods, across different equity markets and for other sets of skilled market participants, including institutional investors, before more general conclusions and implications for capital market information processing can be drawn.

Appendix 1

Window dressing areas addressed in the case study

Note: All the following examples were based on a detailed analysis of the 1985 and 1986 or 1986 and 1987 accounts of a random sample of 50 of the largest UK companies, representing 100 financial statements analysed in all.

²⁷Evidence of such demand is provided by, inter alia, the reception given to the UBS Phillips & Drew's *Accounting for Growth* publication in January 1991 (authors Terry Smith and Richard Hannah), and its rating as the best piece of published stockbroker research for that year in the Extel rankings, the County Natwest *Company Pathology* publication of the same year, the 1992 James Capel *Accounting Matters* book and the Credit Lyonnais Laing *Behind the Balance Sheet* series. The sales of Smith (1992) and associated publicity attest the importance of such issues to a wider public as well.

²⁸Such problems, however, were not generally evident in analyst task completion forms. Also see Footnotes 8 and 14.

ABR 25/98—C

²⁹In the light of our unexpected results, and to provide an independent check on the feasibility of the research task, shortened versions of the experiment were subsequently conducted involving around 40 managers and partners drawn from two of the largest UK accounting firms. The results clearly confirmed the tractability of the exercise.

1. Deferred taxation

The window dressed item constructed consisted of a situation with a very low stated provision but with very large potential liabilities constituted by reversible differences. Such illustrations of this situation were found in the accounts of W. H. Smith, William Baird, Wm. Low and Dobson Park among others.

2. Pension contribution holiday

Appropriating a pension fund surplus is truly an extraordinary event as it seldom happens in a company's life. Therefore, if such a surplus materialises as a contribution holiday, its effects must be presented as an extraordinary item so that earnings per share will reflect normalised profits. One such example can be found in the Dobson Park accounts.

3. Extraordinary items

Our review of the accounts of 50 large UK companies identified large numbers of different items that are treated as extraordinary but which should be included in the calculation of the profit before tax figure, and conversely a smaller set of items that are taken in trading profit but are really extraordinary in nature. The window dressed case contained nine different examples of such items including goodwill written off, a US subsidiary pre-production expenditures written off, and foreign currency deficit arising on consolidation, all of which were treated as extraordinary. The nine items in total represent a highly material amount relative to the stated profit before tax figure in the case study. However, it should be pointed out that clearly not all of these items are likely to be equally important in practice or clear-cut as regards interpretation. The company accounts from which the items used were selected included Argyll Group, Y. J. Lovell, Hepworth Holdings, Gestetner Holdings, Fine Art Developments, Portals Holdings and Dobson Park.

4. Creating profit via asset disposals

On its own, selling assets cannot be classed as window dressing, but when the purpose of the transaction is to create a book profit of such magnitude that a net loss becomes a net profit, or the net profit is doubled, analysts need to make an adjustment to reflect the underlying profitability or normalised profit of the firm. Among the companies using sale of assets or sale and leaseback to create book profits, we can find Fine Art Developments and Wm. Low.

5. Merger accounting

According to the letter of the Companies Act, a vendor placing may be legal. However, it is against the spirit of company law as it constitutes in substance an acquisition. The purpose of such a scheme is essentially to appropriate the profit of the acquired company from the beginning of the preceding financial year while acquisition accounting allows consolidation of the profit of the acquired firm earned only after the acquisition date.

The example used here shows clearly in a note to the accounts, how the company's stated net profit for the year would have been a loss were it not for such a 'false' merger. This situation was inspired by the financial statements of Meggitt Holdings and Babcock International (for the year following our analysis). Note the argument revolves around substance over form.

6. Non-subsidiary subsidiary

Even if many of such arrangements in the real world are not disclosed in a company's financial statements, we have added a footnote to the accounts of our case study example, describing how an exactly 50% owned related company holds a major portion of the borrowings of the group. In fact, when such sums are included in the gearing calculation, the apparently delicate balance between debt and equity collapses. This example was taken from Burton's accounts which, at least, did disclose what many other firms keep hidden. (The Companies Act 1989 effectively prohibits such activities.)

7. Non-capitalisation of leased assets

In our example of such a practice, a substantial amount of assets acquired under finance leases were not included among the tangible assets on the face of the balance sheet, with the matching corresponding liabilities also ignored. This leads to the gearing ratio appearing lower than it is in reality. Our example was built around Thorn EMI's accounts. (SSAP 21 now prevents the non-capitalisation of finance leases.)

8. Hidden interest charges

In this more subtle case, the problem revolves around a convertible bond issued at a low coupon rate (less than half the market rate), but convertible at such a price that an equivalent capital profit accrues to the bond holder. As a result, the annual interest rate charge is reduced in the profit & loss account and this foregone charge is paid for by the company receiving a lower sum than the market price at the conversion date. This latter will have

the effect of reducing the company's capital base on conversion, counter-balanced by the increased profits earned during the life of the bond. In this way, the company can reduce its interest charges during the life of the bond thereby inflating its profit before tax figure. Hillside Holdings provided the basis for the example we used.

9. Non-consolidated subsidiaries

It is common practice for large groups to set up a separate subsidiary to finance their credit sales. At the end of the year, because of a so-called dissimilarity in activities, such subsidiaries are not consolidated with consequential positive impact on gearing.

In our case study, we set up such a subsidiary with very substantial liabilities, impacting materially on the gearing ratio. This situation is disclosed in a note to the accounts, as is required practice. Our example was modelled on such schemes as those shown in the accounts of BAT Industries,

Thorn EMI, Bunzl and Pearson among others in our sample.

Appendix 2

Experimental design

The experimental design was for five institutions (stockbroking firms) on the basis of 12 participating analysts for each firm, divided equally between the experimental and the control groups. Each subject was given two cases, one with no schemes added (John Laing labelled '0' below) and one with a number of schemes added (Dawson International e.g. 1458). The numbers identifying the schemes refer to Appendix 1. Each pair of experimental and control subjects was given the same two cases so there were six different combinations of schemes for each institution. The cases were presented in the order appearing below which means that the first subject in firm number 1 had his clean case labelled A and the manipulated one labelled B. The pattern was reversed for the second participant, and so on.

Institution	Analysts					
	1	2	3	4	5	6
1 First case	0	1458	0	2356	0	89
Second case	1239	0	1367	0	2457	0
2 First case	1569	0	1789	26	0	0
Second case	0	1358	0	0	2478	3479
3 First case	1267	0	0	0	4678	3589
Second case	0	1459	23	2349	0	0
4 First case	0	1346	2458	0	0	4568
Second case	19	0	0	2678	3579	0
5 First case	1468	0	0	2479	4567	0
Second case	0	1357	2389	0	0	56

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The Financial Reporting Practices of British Municipal Corporations 1835–1933: A Study in Accounting Innovation

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Abstract—This paper uses archival sources and contemporary literature to examine the development of the financial reporting practices of British municipal corporations. The paper explores the relationship between accounting theory, as embraced by the literature, and observed accounting practices, and examines both the environmental factors responsible for accounting change and the specific influences that proved crucial at particular points in time. The paper also shows that private-sector based explanations for accounting change do not apply to municipal corporations, and an alternative characterisation is presented.

Introduction

The ancient boroughs of England and Wales date from the 12th century when the Crown began to issue royal charters to certain towns containing arrangements for a degree of local self-government. Growing central government concern with corruption, mismanagement and lack of accountability led to the appointment of a Select Committee and Royal Commission which reported, respectively, in 1833 and 1835. Their findings by and large confirmed central government fears, and the Municipal Corporations Act 1835 made a determined attempt to ensure proper regulation of boroughs, or municipal corporations as they came to be known.¹

The Act provided for the election of a town council based on a franchise which was more democratic than that contained in the Reform Act 1832, and required the minutes of council meetings to be made available for inspection. The borough treasurer was obliged to maintain 'true accounts' of all transactions entered in the borough fund (5 & 6 Will. 4, c. 76, ss. 92–3), to make the books available for inspection by the councillors (s. 93),

to prepare an account for the council as and when required (s. 60), to submit accounts to auditors elected by the ratepayers (s. 37), to sign and 'cause to be printed a full abstract of his accounts', and to make the accounts available for inspection by ratepayers (s. 93).

Municipal corporations were authorised to provide a limited range of services which included: policing, the incarceration of offenders and lunatics, and the organisation of elections. The level and range of expenditure increased phenomenally over the next hundred years. In particular, municipal corporations assumed full responsibility for the health and safety of local inhabitants by providing a wide range of services administered through the district fund, and for further improving living standards within an increasingly urbanised society by the establishment of 'trading' services (water, gas, electricity and tramways) each usually accounted for through a separate fund account.

The figures for local taxation receipts (see Table 1), which show a more than 500-fold increase over the period covered by this paper, are indicative of the massive increase in the scale of municipal operations.

This paper is concerned with the provision of accounting information by municipal corporations for external users which comprised the following main groups: local electors (up to 1918 this class was restricted to ratepayers—afterwards national franchise rules applied); consumers of municipal services; creditors, and investors in local authority securities; and central government.

Accounting disclosure is generally viewed as a product of market and regulatory pressures. Within the market, demand and supply-side considerations are seen to power accounting change. On the demand side, investors bid for information

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¹For a discussion of the broader context within which municipal corporations functioned see Laski et al. (1935), Jones (1992), and Coombs and Edwards (1993).

Table 1¹
Municipal Corporations' Rate Receipts

Year	£
1839-40	197,000 ²
1882-83	7,417,414 ³
1913-14	27,038,124 ⁴
1932-33	102,957,115 ⁴

Notes

¹Over the period covered by this Table the overall cost of living did not show a significant increase. Computed price indices (1661 = 100) being: 1840, 111; 1883, 88; 1914, 91; 1933, 103 ('Back to an Age of Falling Prices', *The Economist*, 13 July 1974, p. 62).

²Appendix to Report on Local Taxation, BPP 1870, lv, p. 72.

³Statistical abstract for the UK, c. 4463, p. 32.

⁴Statistical abstract for the UK, 1938, cmd, 5627, pp. 228-9.

relevant to their investment decisions, while managers (as suppliers) have a strong incentive to provide adequate and reliable information to attract funds. History shows that accounting disclosure has sometimes been market-driven, but growing concerns with market failure have encouraged the development of private and governmental regulation in the western economies, at least, during the 20th century. This scenario for accounting change—market pressures increasingly bolstered by regulatory requirements—provides a helpful reference point for this study which covers a time-period when British organisational entities were pioneering the development of financial reporting practices.²

The paper's specific objectives are: to examine the development of the financial reporting practices of municipal corporations; to explore the relationship between accounting theory, as embraced by the literature, and observed accounting practices; and to examine both the environmental factors responsible for accounting change, and the specific influences that proved crucial at particular points in time.

The research is based, principally, on the contemporary literature and on the records of the following municipal corporations: Birmingham, Bradford, Bristol, Cardiff and Manchester.³

²According to Baskin, 'The Italians may have invented double-entry bookkeeping, but it was the British who pioneered modern financial reporting' (1988, p. 228).

³The archives for the five municipal corporations are located respectively at: Birmingham Central Library, Chamberlain Square, Birmingham; West Yorkshire Archive Service, 15 Canal Road, Bradford; City of Bristol Record Office, Bristol; City Hall, Cardiff; Manchester Public Library.

The key practices

The accounting practices of municipal corporations first received detailed attention from the literature in a series of leading articles published in the principal contemporary accounting journal.

'Accounts have been made up, printed, and circulated, but the defective and often erroneous manner in which they were constructed, their incompleteness, and the meagreness and often entire absence of proper explanations, prevented any but an extremely small section of the ratepayers from obtaining even a tolerable notion of the financial position of the body corporate' (*The Accountant*, 20 September 1884, p. 3).

This paper will help to show whether the leader writer's comments presented a true and fair view of the prevailing practices.

At the start date (the creation of the municipal corporation) and the end date for this study (by which time their system of financial reporting was well developed) there existed broad uniformity between the accounting practices of all boroughs. In the early years of the municipal corporation, a charge/discharge statement was published setting out cash received and paid by the borough treasurer and accounted for through the borough fund (Coombs and Edwards, 1994, pp. 163-70); in 1933 it was the common practice to publish for each fund an accruals-based revenue account, capital account, and balance sheet, together with an aggregate balance sheet which summarised the overall financial position of the entity. An overview of the development of financial reporting practices between these dates is given in Table 2.

The columns headed 'First' indicate the first sign of the adoption of each of the five key practices within a department, while columns headed 'All' indicate that the practice was in use, to an extent, in all departments in existence at the specified date. The notes to Table 2 are indicative of the fact that the introduction of each of the key practices normally occurred gradually within each municipality. The table shows that accounting innovation at the five corporations was spread over the period 1852 to 1922; in other words a 70-year time span from the initial movement away from cash accounting to full accruals⁴ accounting using the double account layout and summarised in the aggregate balance sheet. The outcome was achieved first at Birmingham (1855), then at Manchester (1887), Bradford (1891), Cardiff (1897) and, finally, Bristol (1922).

⁴For the purpose of this study, full accruals accounting refers to adjustments having been made for outstanding credit transactions and stock in hand at the balance sheet date. The method used to account for capital expenditure was very different in local authorities as compared with limited companies (Jones, 1985b; Coombs and Edwards, 1992).

Table 2
Development of Financial Reporting Procedures—Key Practices

	<i>I</i> <i>Accruals</i>		<i>II</i> <i>Accruals based balance sheet</i>		<i>III</i> <i>Capital/revenue distinction</i>		<i>IV</i> <i>Double account system</i>		<i>V</i> <i>Aggregate balance sheet</i>	
	<i>First</i> ¹	<i>All</i> ²	<i>First</i>	<i>All</i>	<i>First</i>	<i>All</i>	<i>First</i>	<i>All</i>	<i>First</i>	<i>All</i>
Birmingham (1838)	1852		1852		1852		1860		1855	
		1852		1852		1852		1860		1855
Bradford (1847)	1856 ³		1856 ³		1856 ³		1857 ³		1852 ⁴	
		1891		1891		1872		— ⁵		1891
Bristol (1373)	1895 ⁶		1895 ⁶		1895 ⁶		1895 ⁶		1895 ⁶	
		1915		1915		1895		1915		1922
Cardiff (1324)	1864 ⁷		1869 ⁷		1864 ⁷		1869 ⁷		1861 ⁴	
		1876		1876		1876		1876		1897
Manchester (1838)	1850 ⁷		1870 ^{3/8}		1859 ^{3/8}		1880 ^{3/8}		1887	
		1881		1881		1881		— ⁹		1887

Notes

¹First evidence of use of practice within municipal accounts.

²Practice in use by all departments/funds.

³Waterworks.

⁴Cash balances of various departments.

⁵Borough account balance sheet never separated into capital and revenue sections.

⁶Change probably made before this date.

⁷District fund accounts.

⁸Change probably made on this date but possibly earlier.

⁹Separate revenue account and capital (improvement) account balance sheets in respect of the borough (city) fund until superseded by rate fund in 1925.

Although not evident from Table 2, it was always the adoption of a key practice by the borough fund that was the last stage (sometimes contemporaneously with its adoption by certain other departments) in the achievement of broad uniformity of accounting practice within a municipality.

Financial reporting: cash versus accruals accounting

In this section we consider: the continued support expressed in certain quarters for cash accounting; the case for accruals accounting; the nature of the 'key' accounting practices identified above, and the broad arguments put forward for their adoption.

The Case for Cash Accounting

We have seen that the Municipal Corporations Act 1835 obliged town councils to make available to ratepayers an abstract of the treasurer's accounts. The precise form of these accounts was never specified, but the requirement for the treasurer to keep 'true accounts of the sums of money by him received and paid' (5 & 6 Will. 4, c. 76, s. 93) implied publication of a cash-based operating statement rather than an income and expenditure account and a balance sheet. It was perfectly natural that the Act's provisions should be interpreted in that manner in view of the fact that the essential features of charge/discharge method of

financial reporting (mainly a cash-based system), employed by certain boroughs at least from 1321 (Jones, 1985a, p. 202), remained in common use.

The continued use of cash-based accounting in certain quarters during the late 19th century, under the banner 'receipts and payments' or 'receipts and expenditure',⁵ has been attributed, in part, to the district auditor's continued insistence on the cash basis to account for those areas where he had jurisdiction (Swainson, 1895, p. 70; Greatrex, 1897, p. 41; but see BPP 1907, xxxvii, minute 6320). The opposition of council members and the continued existence of cash-based statutory reporting requirements also served as stumbling blocks to progress (*Financial Circular*, November 1898, pp. 1–3; Greatrex, 1897). The existence of a perceived legal obligation also to report receipts and payments was neatly satisfied by some municipalities using a three column presentation which showed cash flows in the first column, accruals in the second and income and expenditure in the third (Jones, 1992, p. 96; see, for example, Manchester Borough's accounts for 1900).

There were also some who continued to dispute whether accruals accounting was the superior option. The 1907 Departmental Committee pointed out that the cash approach had the 'merit of

⁵These terms appear to have been regarded as synonymous by the legislature and, to a large extent, by corporations throughout the 19th century.

simplicity' (BPP 1907, xxxvii, para. 27), while specific objections 'of a general character' to the accruals approach included 'the undesirability of admitting into account, as final records, items that may have to be estimated' thereby introducing 'an element of uncertainty' as well as unavoidable 'delay in closing the accounts' (para. 35). Further, the permanent secretary to the Local Government Board expressed the view, in 1903, that the 'advantage that has been felt in having actual cash accounts kept is that it shows what the ratepayers do actually pay during the particular year' (BPP 1903, vii, q. 78).

As late as 1899, correspondence emanating from the County Accountant's office, Trowbridge, expressed doubt about whether the form of accounts prescribed by the Board of Trade for trading undertakings, for the purpose of government returns, permitted the use of accrual accounting. He pointed out that each of the terms income and expenditure was 'only conspicuous by its absence'; also that the pro forma capital account, headed 'receipts and expenditure', can only be taken to imply the need to use the cash basis (Dring, 1899, pp. 46-7).

The Case for Accruals Accounting

Bolton's borough treasurer, George Swainson, in his inaugural address, as president, to the newly created Corporate Treasurers' and Accountants' Institute (CTAI),⁶ in 1886, criticised prevailing reporting practices and drew attention to 'one very large borough in England whose accounts occupy 200 pages, in no place can you find a clear statement of assets and liabilities' (*Proceedings*, 1886, p. 5). *The Accountant* confirmed that there are 'many corporations ... who simply give a statement of their receipts and payments' (11 November 1884, p. 3). Indeed, up to the end of the 19th century, leader writers for professional journals continued to perceive a need to advocate the adoption of accruals accounting (*The Accountant*, 13 February 1897, p. 172; *Financial Circular*, November 1898, p. 1).

The relative merits of cash and accruals as the basis for financial reporting were considered by the Departmental Committee on the Accounts of Local Authorities, 1907, which lists the advantages of the latter as follows: it records every step of a transaction thereby protecting against negligence and irregularity; it enables the statement of an entity's profit and loss and financial position; it records values; and it provides a stable and homogeneous basis for statistics.

The drawbacks of cash accounting are seen to be: that it is an incomplete representation of events for reporting and control purposes; that it provides scope for delaying payments in order to manipulate the accounts and influence the level of rates (BPP 1907, xxxvii, paras. 26-39). Further advantages claimed elsewhere for accruals accounting, in the context of the local authority, were that it provided a better basis for the purpose of setting the rate (Cooke, 1887, p. 167), and for demonstrating the extent to which actual results varied from the estimates (Guthrie, 1886, p. 615).

Distinguishing Capital from Revenue

Many of the municipal corporations, newly created in 1835, possessed little or nothing in the way of corporate assets (Bristol was an important exception). Indeed some of them inherited net liabilities, and it was necessary to borrow money to finance the supply of new services. Loans were raised by special Acts of Parliament or under Provisional Orders which also made provision for repayment.

The basic philosophy underlying these regulations, and many others applying to loan sanctioning, was to guard against the creation of permanent loan capital and to ensure that local authorities did not overborrow; the test being whether repayment was made within the life of the asset acquired. The obligation to repay loans within prescribed periods, and to rate accordingly, implied a need to separate capital transactions (the historical record of the amount raised and repayable) from revenue items, with the latter including provision for the redemption of the debt.

In a stewardship environment, with officials keen to demonstrate financial probity and compliance with statutory obligations, the natural outcome was to provide ratepayers with a detailed statement of capital raised, and therefore repayable out of the rates, and how the money had been spent. This treatment gained momentum from the 1850s onwards as corporations increased their borrowing in order to meet their statutory obligations to provide health and sanitary services under the Local Government Act 1848 and to undertake the supply of gas and water in response to governmental encouragement (Falkus, 1977, p. 139). We have seen above that this information occupied a great deal of space in the annual abstract, but it required no departure from a cash-based financial reporting system.

The Double Account System

The double account system of financial reporting (Edwards, 1992, pp. 67-8) is able to combine the attributes of charge/discharge accounting (stewardship orientation) with commercial accounting (profit calculation). A leader in *The Accountant*, 1893, summed up one of the main

⁶The CTAI, established in 1885, was renamed the Institute of Municipal Treasurers and Accountants (IMTA) in 1901 and the Chartered Institute of Public Finance and Accountancy in 1973.

arguments for the double account system as follows:

'... no one would [then] be deceived into supposing that there was any necessary connection between the amount of expenditure appearing to the debit of the capital account and the actual value of the works existing as the result of that expenditure' (1893, p. 718).

Support for this method on the basis that it provided a sound stewardship record of capital transactions⁷ came from a number of quarters (Swainson, 1895, p. 72; Harris, 1903, p. 221; Miller, 1905, p. 20).

The double account system was used by transportation and public utility companies from roughly the mid-19th century onwards, but it would be wrong to assume that municipal corporations adopted procedures developed within the private sector simply as a convenient 'off the peg' solution to their reporting requirements. As noted earlier, the statutory financing obligations imposed on local authorities *naturally* led to the development of procedures that contained the main features of the double account system—a separation between capital and revenue transactions, although it is possible that they imported from the private sector the final element required—the general balance sheet—to complete the reporting package.

The Aggregate Balance Sheet

The aggregate balance sheet brought together the year-end balances for each of the funds and departments, and its purpose was to provide a 'bird's eye view' (McCall, 1930, p. 96) and 'disclose in one statement the financial position of the authority as a whole' (Whitehead, 1931, p. 118). Bradford's accounts for 1900 refer to the fact that 'the financial position . . . may be seen at a glance by reference to the aggregate balance sheet'. Guthrie is similarly enthusiastic, seeing its virtue as 'condensing' the individual results of each department 'so as to exhibit in the briefest form the grand total of the true balance sheet of the city' (1886, p. 615).⁸

The precise content of the aggregate balance sheet varied depending on the range of services supplied, the bookkeeping system in force, and presentation of data in the individual fund accounts. Some boroughs (e.g. Bradford from 1891)

maintained a distinction between expenditure on capital account and revenue account in respect of each fund; others (e.g. Manchester, 1887) made no such distinction. The horizontal format for the aggregate balance sheet was used at Cardiff and Birmingham, but at each of the other three boroughs a tabular format was used from the outset.

Each of the innovations considered in this section of the paper obtained a strong foothold and complete adoption in most cases; the exception was the failure of Bradford and Manchester to implement fully the double account system for the purpose of the borough fund, although a clear distinction was always maintained between capital and revenue transactions.

The process of accounting change

We now examine the main factors responsible for the adoption of accruals-based financial reporting.

The Regulatory Framework

We have seen that the Municipal Corporations Act provided for the publication of an audited abstract of accounts, while the Local Government Act 1858 obliged local boards of health⁹ to make an annual report of 'receipts and expenditure' on the district fund to the Secretary of State, and to publish the same in a local newspaper (21 & 22 Vict., c. 98, s. 76). These broad requirements remained unaltered until the third decade of the 20th century when we begin to find evidence of statutory recognition of the need to move towards accruals accounting (Coombs and Edwards, 1993, p. 43). We must therefore look instead to the local government sector's professional accounting body for evidence of regulatory pressure to bring about accounting change.

The CTAI's determination to standardise financial reporting practices appears to have been influenced by stinging criticisms contained in the authoritative *Burdett's Official Intelligence*¹⁰ and in the columns of *The Accountant*. Swainson tells us that these publications had complained that 'it was impossible for several corporations to prepare an accurate balance sheet of their assets and liabilities' (1889, p. 29).

The CTAI therefore requested the Local Government Board to exercise its power, under the Public Health Act 1875 (38 & 39 Vict., c. 55, s.

⁷Capital transactions were reported in a separate capital account and also appeared in summarised form in the balance sheets published by municipal corporations (Figure 1).

⁸It is argued in Edwards (1992) that these statements were forerunners of the group accounts which British limited liability companies began to publish in the second decade of the 20th century.

⁹Within the borough, the town council acted as the board of health (Local Government Act 1848, 11 & 12 Vict., c. 63, s. 12).

¹⁰This annual publication was compiled by Henry C. Burdett, secretary, Share and Loan Department, London Stock Exchange, from 1882 to 1908.

including the income and expenditure of each year, the income being shown on the right hand page of the published abstract, and the expenditure on the left hand page. Each set of accounts should include a balance sheet, embodying the whole of the ledger balances, the stock of stores, the outstanding liabilities and assets, which should include outstanding (and collectable) rates, and the balance shown on the revenue account. It is desirable that there should be shown for every fund, a revenue account, a capital account, and a balance sheet. It is also desirable that a general or aggregate balance sheet should be inserted in every abstract. The borrowing powers, capital expenditure, and sinking funds, should be clearly shown' (*Proceedings*, 1890, pp. 5-6).

The letter urged each member to, 'as far as the circumstances of your case will allow, adopt the above suggestions, if you have not already done so'.

Progress was slow according to the president of the CTAI:

'The published accounts of some corporations are still merely summaries of receipts and payments, while others are complete statements of income and expenditure for the year ... [and] ... I doubt whether it will be possible to attain anything like uniformity in the mode of publishing abstracts of corporation accounts until some prescribed form of accounts is issued with authority by the Local Government Board' (*Proceedings*, 1894, p. 13).

We may infer from Table 2, however, that the CTAI was encouraging the adoption of procedures *already* used by the more enlightened municipal corporations. The favoured procedures were being used by four of the corporations covered in this study by 1889; only Bristol (for reasons considered below) was slow to change.

The broad question of uniformity was considered by the Joint Select Committee on Municipal Trading 1903 which favoured the principle of uniform accounts, but was doubtful whether it would be possible to prescribe a standard form suitable for all municipal and other local authorities, having regard to the varying conditions existing in different districts (MacMillan et al., 1934, p. 26). The 1907 Departmental Committee re-examined the matter and reported that progress was being made, but that there remained ample scope for further improvement. It seems that the receipts and payments basis was used by very many smaller authorities¹¹ and, '[although] most of the

larger authorities follow more or less comprehensive systems of income and expenditure ... there is little uniformity as regards the form in which the abstracts of the accounts are presented to the ratepayers' (BPP 1907, xxxvii, 589).¹² The case for standardisation was also spelled out: Otherwise

'direct comparisons [between authorities] may often be fallacious and misleading. But such uniformity as can be obtained is no doubt desirable in itself: the possibility of comparison, even if incomplete, tends to foster interest in the accounts, and to stimulate criticism and investigation which may lead to substantial improvements in administration' (BPP 1907, xxxvii, 601).

Standardisation was considered, by the 1907 Departmental Committee, to be both desirable and achievable, and its report contained proposals consistent with the general instructions issued by the CTAI to its members in 1889. Attached to the report are recommended standard forms of accounts for electricity, gas, water and tramways, and for non-trading activities. The accounts are based broadly on the double account system of financial reporting (BPP 1907, xxxvii, 615, Schedule A-E), of which the initial draft was prepared by the IMTA whose contribution is gratefully acknowledged (BPP 1907, xxxvii, 611). No immediate steps were taken to give effect to the above recommendations.

In the years that followed, annual meetings of the IMTA record unsuccessful attempts to persuade the Board of Trade to issue prescribed standard forms of accounts.¹³ The IMTA therefore decided to take the initiative, in 1913, of issuing to its members standard forms for 11 of the main local authority non-trading accounts.¹⁴

A statutory development of significance was contained in SR & O, 1930, no. 30, issued by the Ministry of Health under the District Auditors Act 1879. The Order covered the accounting practices of municipalities only to the extent they were subject to the district audit (e.g. education) but, according to a contemporary authority, 'the

¹²A further criticism was that 'in many cases the general results of the authority's operations are obscured by the mass of detail shown' (ibid., 587).

¹³It seems, however, that the forms attached to the 1907 Departmental Committee's report, except for the electricity accounts which continued to be prepared in the 'old [1883] form' for the purpose of returns to the Board of Trade, 'have been so generally used that they are by common consent received as standard forms' (*Proceedings*, 1913, p. 56).

¹⁴It is noted that the IMTA had previously (1905) issued, in conjunction with the Municipal Tramways Association, a 'Suggested Standard Form of Tramway Accounts'. The general move towards standardisation was completed as a result of action taken by the IMTA in 1938 and 1955. For a discussion of these provisions see FIS, 1972, and for subsequent developments see Jones and Pendlebury (1982).

¹¹This reference is to parishes and district councils.

regulations are of great interest and importance, representing as they do, an official pronouncement regarding the application of the principles of accountancy to the transactions of local authorities, and it is probable that many authorities, to whom the regulations do not apply compulsorily, will follow the principles enunciated therein' (MacMillan et al., 1934, p. 27). According to Carson Roberts, the regulations 'were considered and agreed by the IMTA and the Association of Municipal Corporations before being promulgated by the Minister and were also submitted to the Association of Urban District Councils and accepted by that body as appropriate for its members' (1930, p. 386).

The new regulations, however, although covering the main principles of record keeping and financial reporting—specifying use of the double account system and the income and expenditure basis—did not tackle the precise form of published accounts. Nor did the Local Government Act 1933 which merely re-enacted existing legislation with few modifications. We will see, however, that other factors had already conspired to achieve fundamental change in the form and content of published accounts.

Public Accountants

From 1835 to 1933 there was a statutory requirement for municipal accounts to be audited by two officials elected by the local inhabitants. In 1884, the absence of a requirement for these individuals to possess an accounting qualification and the perceived lack of professionalism on the part of the corporations' financial officers (the CTAI was not formed until 1885) were the subject of attack from an editorial in *The Accountant*.

'There are probably few kinds of accounts which would require more skilful treatment in the form of setting them forth than those of municipal authorities, but it is very unlikely indeed that any improvements which time or circumstances might render necessary would be effected from within. There are many corporations now who simply give a statement of their receipts and payments . . . it is questionable if there could be found in most of these corporations officials capable of doing this [preparing a balance sheet] in a correct manner' (8 October 1884, p. 3).

These criticisms must again be interpreted mindful that this journal was keen to advance the interests of its principal readership (chartered accountants) and, in the next section, we show that local initiatives provided an important impetus for accounting change before 1884. Nevertheless, there is ample evidence of the initial involvement of public accountants in the affairs of municipal corporations

being associated with significant developments in accounting practice.

The public accountant, W. R. Kettle, was called in to audit Birmingham corporation's recently established accruals-based accounts for 1855, in which year an aggregate balance sheet was first prepared. At Bradford, a major review of the corporation's accounting system was mounted on 13 February 1872 (minutes, p. 526), following the discovery of a cash deficiency in the treasurer's office. The public accountant, a Mr Blackburn,¹⁵ called in to examine the accounts, found that money had been advanced to Harris, as treasurer, for the payment of wages and other disbursements and that 'he was unable to account for the whole thereof and that the extent of the deficiency amounted to £507.4.0½' (4 March 1872, p. 549). Blackburn was then 'requested to prepare a fresh set of books for simplifying the accounts in the borough accountant's office' (minute dated 8 April 1872, p. 561).

A second example occurred at Manchester where the prominent 19th century accountant, David Chadwick, was auditor of the corporation's trading activities in the late 1850s, at a time when they were transferred from the cash basis to the accruals basis.¹⁶ Progress elsewhere in the borough's accounts was slow, with cash-based accounts being rendered up until 1880 when 'proper balance sheets' were introduced following 'the employment of one of the leading firms in that City as professional auditors' (*The Accountant*, 11 October 1889, p. 4). The firm appointed was Broome, Murray & Co., chartered accountants, one of whose partners, Adam Murray, wrote on municipal finance. A few years later this firm was replaced by Thomas, Wade, Guthrie and Co., chartered accountants, where Edwin Guthrie was an even more prominent contributor to the literature. Guthrie confirms the influence of professional accountants on the financial reporting practices of Manchester, drawing attention to the fact that they 'have been steadily elaborated in the direction of simplicity, comprehensiveness, and precision' (Guthrie, 1886, p. 615).

The contribution of professional accountants to the development of municipalities' financial reporting practice receives confirmation from prominent municipal treasurers of the day. Lister Woodhouse (president of the CTAI 1900-1) tells us that Burnley's auditors 'year after year suggested fresh improvements in the accounts' and 'I do not remember a single suggestion being rejected' (1894,

¹⁵Probably either J. or J. H. Blackburn of the firm Blackburn & Co., Bradford, founder members of the Institute of Chartered Accountants in England and Wales.

¹⁶Chadwick has also been described as 'instrumental in commencing the accounts of the borough' of Salford (Guthrie, 1886, p. 627).

p. 433). While George Swainson, the borough treasurer of Bolton, quotes with evident approval *The Accountant's* observation that 'whatever improvements have been made from time to time in the manner in which the accounts of corporations are stated are in almost every instance a result of the representations of a chartered accountant, acting either as a borough accountant or as a professional auditor' (1895, p. 72).

Local Initiatives

In the preceding section, it has been suggested that accountants brought in from outside played an important part in the development of municipal financial reporting practice during the 19th century, although in a number of cases it has been impossible to state more than the fact that the new appointment and an accounting innovation occurred in the same year. In this section we consider cases where improvements appear to have been the result of initiatives from the corporation's officials, usually the treasurer, and the extent to which the need for improvement arose from an increase in the size and complexity of the corporations' activities.

In 1851, following the passage of the Local Government Act 1848, Birmingham Borough released responsibility for public health from under 'the rule of a self elected body of [Improvement] Commissioners [which] had long been resented as out of harmony with modern ideas and as being unsuited to the fast growing requirements of the town' (*Birmingham Daily Post*, 26 December 1888). Birmingham Corporation immediately adopted a dual system of bookkeeping (cash-based and accruals-based) and financial reporting, which meant that its non-statutory accounts were on the full accruals basis and differentiated between capital and revenue from 1852. As was normal practice, piecemeal changes in the direction of distinguishing clearly between different activities and achieving a more organised format continued during the next decade or two. An important step towards the full accruals accounting occurred in 1859 when it was decided that 'a detailed account of the stock and plant of the corporation be kept, and an account of stock in each department be taken annually' (1865 minutes: 5094).

In 1870 W. R. Hughes, appointed treasurer in 1867, 'thoroughly revised the system of accounts, and substituted one blue book'¹⁷ for the previous system (Briggs, 1952, pp. 125–6). The inefficiency of operating two separate systems had become evident to Hughes, and seems to have arisen from the need to prepare the statutory abstract up to 1

September, whereas the calendar basis was favoured for the purpose of preparing accounts to be used by the members and published annually in the month of January (Borough treasurer's report, minute 5848). The revised form of accounts put forward by Hughes, and adopted for the purpose of 1870s accounts, aimed at a one third reduction in the combined length of the white and yellow books. Writing a couple of decades later, Hughes tells us that further 'improvements have been made in this book year by year and it is considered by the competent authorities to be a model of municipal finance' (1889, p. 181).

The result was that the blue books 'increased from being pamphlets to large volumes' (Briggs, 1952, p. 126). Indeed, it seems that the accounts had become too long and a finance sub-committee was set up, at the turn of the century, working in conjunction with the treasurer and the professional auditor, Howard S. Smith,¹⁸ reflecting concern that 'the blue book has grown to such a size that it really prevents persons interested in the city accounts from studying it'. The committee's findings were put into effect for the purpose of the 1901 accounts which are preceded by a memorandum specifying the changes designed to improve the overall format and reduce its length by some 200 pages. This was achieved by merging and condensing material and deleting unnecessary repetition. For example, instead of separate statements for receipts and payments and income and expenditure, a single statement employed a four column presentation which adjusted cash flows for opening and closing debtors and creditors.

The first accounts prepared for Bradford Corporation are in respect of the year to 1 September 1848. They are on the cash basis and remain in that format until 1856 when three of the key practices identified in Table 2—accruals accounting, an accruals-based balance sheet and a distinction between capital and revenue—are exhibited in the accounts for the water works acquired from the Bradford Water Works Company in that year. It is possible that here we come across an important factor affecting the development of accounting practice, namely the adoption, following takeover, of procedures already in use in the private sector.

We have seen that the revelations surrounding the discovery of Harris's defalcation in 1872 resulted in the engagement of the accountants, Blackburn & Co, who produced a new scheme for preparing the books. It also saw the appointment of John Hamer, previously the borough accountant of Salford, as treasurer. These changes were together probably responsible for an expansion and general

¹⁷The term blue book was used to distinguish it from the white book and the yellow book previously in existence; the new term gradually achieved widespread acceptance as the appropriate description for a corporation's published abstract.

¹⁸Smith had been clerk to the corporation, some time earlier, but resigned in 1867 when his application for promotion to the position of treasurer was unsuccessful; Hughes being appointed instead.

improvement in the form, order and content of the corporation's accounts for 1872 and 1873.

The next significant development occurred soon after the promotion to treasurer, in 1889, of the corporation's accountant, T. A. Thorpe. In 1891 the borough accounts are at last placed on the accruals basis; the presentation adopted was first to list all receipts and payments and then, at the end of the statement, make the adjustments required (debtor and creditor) for conversion to the accruals basis—a procedure criticised, in some quarters, on the ground that the accounts fail to show the income and expenditure of individual departments comprising a particular fund. There is also published for the first time an aggregate balance sheet.

Bristol's district fund accounts exhibit all five key characteristics from 1895, which is the first year that financial information for this aspect of the municipality's operations survive, but the archives show that they were on the full accruals basis before that date. A committee, appointed in 1894 to consider transferring the borough fund accounts from the cash basis to the accruals basis, expressed broad satisfaction with existing practices. It noted that published data already exceeded statutory requirements and observed 'that they may with advantage to the public be still further amplified'. With that objective in mind it was decided to adopt 'so much of the forms used at Birmingham, Bradford and Liverpool, as may be considered applicable'. A number of additions were made to the accounts in the form of supplementary data, but the only significant change in the form of the borough accounts was to distinguish for the first time between capital and revenue transactions (report dated 7 February 1894).

Twenty years later the finance committee was asked once again to examine auditing and accounting matters. It reported that the accruals basis 'undoubtedly has the advantage of setting out clearly the position of each committee at the end of the financial year' and recommended that the borough fund account be at last placed on the same basis as the district fund account (report dated 5 March 1914).

A possible explanation for the slow rate of change, at Bristol, is the persistent use of 'home grown' talent for appointments to the position of borough treasurer. John Harford, treasurer from 1855 to 1881, was 'in harness' for 65 years, having served his apprenticeship in the office of the previous borough treasurer, Thomas Garrard, who himself spent 54 years working for the corporation. Harford's successor, John Tremayne Lane, also worked his way up from the position of clerk and remained as treasurer till 1921. The appointment of W. Legh Smith, previously the City accountant at Hull, in 1921, may have been a breath of fresh air.

In the following year an aggregate balance sheet was introduced for the first time, together with an 'epitome' summarising the major financial developments at Bristol. Both changes are highlighted by Legh Smith in his brief report on the contents of the published abstract.

At Cardiff Borough, cash-based financial statements setting out transactions between the treasurer and the corporation were prepared at least as early as 1790 (Coombs and Edwards, 1994, p. 169). These were therefore already in a format consistent with the requirements of the Municipal Corporations Act 1835, and statements continued to be prepared in that manner until the early 1860s.

A distinction between capital and revenue expenditure was made in the district fund account for 1864; the first year for which accounts for that fund have survived. The substantial increase in borrowing required by the municipality to discharge its responsibilities as a health board is likely to have motivated the need for an improved system of accounting and financial reporting.¹⁹ Piecemeal improvements in the financial reporting system include the adoption of the double account system for the district fund in 1869 and the application of four of the five key practices (aggregate balance sheet excepted) to the borough fund in 1876. All these developments took place before the City began to undertake trading activities, starting with the acquisition of the water works in 1879.

The system of financial reporting changed little between 1876 and the mid-1890s when the position of the elective auditors came under review. In 1895, the elective auditors, Oswald Coleman (a chartered accountant) and Alfred Maurice Bailey (an incorporated accountant) refused to continue to act as mere figureheads (the real audit having been undertaken by a professional accountant—David Roberts—since 1869) and insisted on doing a more thorough job, each claiming £22.1 s for his services and making recommendations including the suggestion that the accounts be made up half yearly in accordance with Municipal Corporations Act 1882 (45 & 46 Vict., c. 50, s. 27).²⁰ The town council resisted efforts to introduce a more effective elective audit, but there is evidence suggesting the auditors' actions caused the corporation to review its financial reporting practices.

A resolution dated 22 April 1895, established a committee to consider 'unsatisfactory estimates' and see what could be done with the 'object of reducing the rate'. The committee carried out a wide-ranging review and recommended: that the

¹⁹The accounts for the year show £48,000 borrowed from the Atlas Assurance Company to finance the construction of the city's sewerage system.

²⁰It had become quite common for municipal corporations to make up just one set of accounts for the year, usually to 31 March, but the legality of this practice was uncertain.

borough treasurer's claim that he was understaffed be investigated; that work correctly charged to capital be identified and authorised by the council, and afterwards sanction for borrowing be obtained from the Local Government Board; that there be added to the annual financial statement a district stock account showing the properties of the corporation in kind and value; and that separate ledger accounts be kept showing the income and expenditure on a fortnightly or monthly basis, so that each committee 'would be able to keep a close watch over its own affairs' (minutes 1895, 436-44). A meeting of the special finance committee on 27 April 1896 'discussed the principles upon which the liabilities and assets of the corporation might be published in the treasurer's annual accounts distinguishing between remunerative and unremunerative works, and directing the borough treasurer with regard to certain forms submitted as applicable thereto' (1896 minutes, 2215).

The published accounts for 1897 distinguish, for the first time, between remunerative and unremunerative expenditure and also include: a much fuller balance sheet for each fund (illustrated in Figure 1); an aggregate balance sheet for the borough as a whole; and an inventory 'statement of liabilities and assets'.²¹

At Manchester, the first evidence of accruals accounting is again found in the early accounts for the district fund, this time in 1850. Progress was slow, however, and it is only in the water works accounts for 1859 and 1870 that we respectively find evidence of a distinction being made between capital and revenue expenditure and the preparation of an accruals-based balance sheet. It has been previously pointed out that the borough accounts remained on the cash basis until very late, and it was only the engagement of professional accountants, as auditors, around 1880 which resulted in their major revision. In the mid-1880s the corporation decided that 'having regard to the rapid growth of the business of the corporation; it appears necessary that the entire system of corporate finance should come under review' (minutes, 7 January 1885). A sub-committee consisting of the mayor and six others collected information from other boroughs, including Liverpool, Birmingham

and Glasgow, and concluded that the 'published financial accounts of this corporation are now conspicuous for their fullness, clearness and simplicity' (minutes, 22 October 1885).

Assessment and conclusion

The purpose of this paper has been to identify and explain the development of the financial reporting practices of municipal corporations over a 100-year period, at the end of which the essential structure which remained in force until municipal corporations were abolished in 1974 had been created.

We have addressed these objectives by identifying five key accounting practices, tracking their development and considering factors responsible for observed changes. A reference point for this analysis was *The Accountant's* (1884) criticism of the backward state of municipal accounting. We have seen that the move towards the adoption of the key practices was well underway prior to 1884. Of the 50 dates listed in Table 2, 32 are pre-1884, as are 13 of the 25 dates applying to the adoption of these practices *throughout* the corporation. This does not mean that the key practice was *fully* implemented on the dates specified, and the municipal corporations covered by this survey were of course large, but it does suggest that progress was rather more significant than claimed in *The Accountant*. Moreover, the criticism of the local authority practices, by implication, compared with those of limited companies seems totally unjustified; until the passage of the Companies Act 1929, limited companies typically published a two or three page document comprising a brief directors' report and a summarised balance sheet.

We have seen that a common pattern of evolution occurred at all five corporations and the various steps in the process have in most cases been identified. It has naturally proved more difficult to identify the precise causes of change. The incentives for local authorities generally to publish information have been studied by Rowan Jones, who has applied the central government-based economic model of Anthony Downs to the local level (1992, ch. 5). Put very succinctly, Downs believes that there is no incentive for the electorate to seek accounting information: if they favour a political party, the information will not affect their decision; if they do not have a preference, the accounting information will be of no interest to them. At local level, Jones makes the additional point that there is no incentive to seek out accounting information for the purpose of lobbying because the cost would outweigh any possible benefit. Jones' further analysis of the groups interested in the provision of accounting information—'the statutory nexus', comprising councillors, officers, ratepayers, clients, electors and the government

²¹This last-named statement seems to have been regarded as a financial virility symbol by certain late-Victorian municipal corporations, and represents a 'rough and ready' attempt to calculate the extent to which a corporation's infrastructure had been financed by past generations. At Cardiff, for 1897, the first entry in the statement is the balance transferred from the capital account captioned 'Excess of assets over liabilities'. To this is added a range of other assets belonging to the borough—fixed assets, materials and stocks purchased out of revenue; miscellaneous properties at the borough engineer's valuation, less amounts included at cost in the capital account; rentals on properties not in capital account capitalised at rental $\times$ 27 years; and the balance on revenue account—to arrive at 'total assets over liabilities' of £688,452.

(1992, p. 122)—leads him to conclude that none has any incentive to influence the accounting function except the government. And their involvement is designed to impose controls over the elected councillors (*ibid.*, p. 138).

As postulated by Jones, we have found virtually no empirical evidence to suggest that innovation was a response to the demand from ratepayers for more or better information. With ratepayers the intended recipients of accounting reports, it might have been expected that their interest would rise in line with the growing financial demands imposed upon them through rising local taxation. Memorials were found at Cardiff (Cardiff archive, box 503) and Birmingham (1855 minutes, 786) objecting to various items of expenditure, but no criticism was discovered of the accounting practices themselves. There is also some evidence of national associations of ratepayers criticising local authority accounting methods, but not much. For example, evidence presented by James Walker on behalf of the National Chambers of Trade and the Association of Trade Protection Societies to the 1907 Departmental Committee expressed concern over the continued rise in rates and recommended 'in the interest of the community' the introduction of statutory regulations similar to those put forward by the CTAI in 1889 (paras. 3,674–886).²² The general impression gained is that ratepayers and their associates were sometimes vociferous in their condemnation of the level of local taxation but that they did not see the content of published accounts as relevant in reinforcing their objections.

In another respect, the lack of ratepayer interest in the accounts is not entirely surprising. From about the 1880s onwards, the length of the 'blue book' increased phenomenally in response to the level of accounting sophistication employed in their preparation and range of services offered. Abstracts of more than 200 pages became the norm and 400 to 500 or even 600 pages were by no means unknown. Early on there was considerable variation in terminology and the many financial statements published were often poorly presented but, even when a more stereotyped format was developed, the accounts are unlikely to have been comprehensible to anyone without specialist financial expertise. According to Allen:

'The criticism is frequently heard that the published accounts of local authorities are so complicated as not to be readily understood, and so full of detail as to be confusing. Not one ratepayer in a thousand ever makes a serious attempt to peruse and understand

these accounts, and of the few who do, ninety-nine out of a hundred give up in hopeless despair and, perhaps, express disgust' (1912, preface).

Indeed, we have seen comments from municipal officials to the effect that the reason for change was to improve the readability and comparability of the accounts. An important development, in this respect, was the publication of the epitome, described as 'a short report setting out in a concise and non-technical form the salient features of the year's financial transactions' (*Financial Circular*, February 1927, p. 43; see also Sutcliffe, 1927). A further initiative was the inclusion of graphical presentation that was pioneered, at Sheffield, during the first decade of the 20th century (Allen, 1912) and was adopted for the purpose of Manchester's accounts by 1920 and Cardiff by 1926. However, the indications are that these innovations are made more in the endeavour to interest the ratepayer in a municipality's financial affairs than as a response to any demand for better information.

We also agree with Jones' contention that statutory regulations exerted an important impact on the financial reporting practices of local authorities in general and municipal corporations in particular, but we believe that they have done so in only certain limited respects. Their influence has been principally in the direction of encouraging the publication of detailed *cash-based* financial statements which distinguish between amounts spent on capital account and on revenue account. In other words, the statutory requirements explain the adoption of key practice 3, but not the others.

The contribution of this study is that it provides empirical support for Jones' contention that accounting innovation was supply driven rather than demand led, and also demonstrates the determination of *two other groups inside* Jones' statutory nexus (the officers and the council) and *one outside* (the accounting profession) to develop the reporting package far beyond statutory obligations. The statutory support provided for the publication of cash-based accounts proved an obstacle to the move towards accruals accounting, but it was one that was overcome. The factors bringing about accounting change were many and varied. In the endeavour to identify individual factors, there has been inevitable over-simplification since, in many cases, change was no doubt the result of a combination of events, not all of which are reflected in surviving archival material.

Having said that, the main influences were the need to account more effectively for growing municipal expenditure, with the distinction between capital and revenue dictated by statutory obligations. Changes usually became apparent, first in respect of expenditure designed to ensure that the

²²Much later, in 1933, the Ratepayers' Association of Tredegar and District successfully arranged for Bedwelty Urban District Council's accounts to be examined by a professional accountant (*Rex v. Bedwelty, ex parte Price*, 1934 1KB 333).

borough was a healthier place in which to live (the district fund), secondly in the provision of trading services, finally spreading through the entire borough accounts. The sequence was similar in the case of accruals accounting; a technique that was presumably adopted because it was judged to possess the range of virtues identified earlier in this paper.

Town councillors took the voluntary step of engaging professional auditors in addition to the elective auditor, and there is evidence, particularly at Manchester but also elsewhere, to suggest that the former both encouraged and advised on the subject of accounting change. The dominant force bringing about improvement, however, seems to have been the members and officers (particularly the treasurer) of the corporation, with the latter more likely to prove innovative when engaged from outside rather than promoted internally.

In this context, it is worth noting that the findings from this study are consistent with recent research into users of local authority accounts. Collins et al.'s 'layered schema of potential users' sees councillors and officers as most prominent followed by central government; the general public together with pressure groups trail a poor third (1992, chapter 2). One might therefore imagine that councillors appointed to committees would have been keen to obtain full financial information concerning the results of departments for which they were responsible and, once this information was available, it was simply convenient to combine together the reports of each committee to produce the accounts for the borough as a whole. In circumstances where there was concern to demonstrate financial probity in respect of public money, little or no competition, and minimal evidence of accounting data being exploited by ratepayers to embarrass the town council, what could be more logical?

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Contents

SPECIAL ISSUE ON EMERGING MARKETS IN HIGHER EDUCATION *Editor: Michael Bourn*

Foreword

by MICHAEL BOURN

Formula Funding of UK Higher Education: Rationales, Design and Probable Consequences

by DAVID HEALD AND NEAL GEAUGHAN

Regulation, Rent Seeking and Reform in Higher Education

by ALAN HAMLIN

On the Allocation of Resources Within Universities

by GEOFFREY WHITTINGTON

Meeting the Indirect Costs of Support Services in Universities: Top-Slicing, Charging-Out, Taxes, Trading, and Devolution

by MICHAEL BOURN

On Managing Hybrids; Some Dilemmas in Higher Education Management

by MAUREEN MACKINTOSH, ROBIN JARVIS AND EDMUND HEERY

Administrators as Managers of Change at the Karolinska Institute

by IAN COLVILLE AND CYRIL TOMKINS

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Decentralisation as a Moderating Factor in the Budgetary Participation-Performance Relationship: Some Hong Kong Evidence

Ferdinand A. Gul, Judy S. L. Tsui, Steve C. C. Fong and Helen Y. L. Kwok*

Abstract—This study tests the contingency or 'fit' hypothesis that the effects of budgetary participation on managerial performance will be positive in decentralised organisations and negative in centralised organisations. The responses of 37 managers from a cross-section of Hong Kong manufacturing companies to a questionnaire survey designed to measure the variables were analysed by examining the interaction term in a multiple regression equation. The results supported the interaction hypothesis and found that at high levels of decentralisation there is a positive relationship between budgetary participation and managerial performance but at low levels of decentralisation this relationship is negative. These findings have implications for the design of effective control subsystems.

Introduction

The relationship between budgetary participation and performance (hereafter referred to as BPP) has for some time now attracted the attention of several researchers (Argyris, 1952; Becker and Green, 1962; Brownell, 1981; Birnberg et al., 1990). While some studies have found a positive relationship between participation and performance (Bass and Leavitt, 1963; Kenis, 1979), other studies, for example, suggested that the BPP relationship was weak (Milani, 1975), or even negative (Bryan and Locke, 1967). These mixed results have led researchers to conclude that there is no simple direct relationship between budgetary participation and performance and that there could be other variables that could act as moderating or intervening factors in this relationship (Hopwood, 1976; Brownell, 1982a; Murray, 1990; Shields and Young, 1993). More than a decade ago, Brownell (1982a), in reviewing research on participative budgeting, concluded that:

'Research effort to date tended to focus attention on the more general question of whether participation is effective or not, rather than specifying the conditions under which it is effective. Conflicting results permeate the literature ...' (pp. 146-147).

These conditions were classified by Brownell (1982a) under four groups of variables: cultural, organisational, interpersonal and individual.

As a result of these concerns, several studies using the contingency approach have systematically evaluated various conditions or variables that could affect the BPP relationship. For example, Mia (1988) found that the BPP relationship was moderated by job difficulty and Brownell (1981) demonstrated that locus of control, a personality variable, also moderated the BPP relationship. Based on Brownell's (1982a) suggestion, it is clear that there are other variables such as organisational structure and culture that remain to be evaluated. The examination of the moderating roles of these variables not only facilitates the development of more comprehensive models but also improves our understanding of the workings of budgetary relationships in organisations (Govindarajan, 1986).

An important organisational variable that could potentially affect the BPP relationship is the level of decentralisation. At high levels of decentralisation, participation in the budgetary process is not only desirable but also inevitable. This is consistent with the following point made by Emmanuel et al. (1990):

'As a result of the high incidence of non-programmed decision taking in the decentralised, multidivisional firm, top management has to rely to a large extent on divisional managers' judgment. The involvement of divisional managers in supplying forecasts, plans and information about alternative actions is inevitable' (p. 112).

Besides, as pointed out by Emmanuel et al. (1990, p. 58), both participation and decentralisation should be viewed as a control package and are

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interdependent. For example, participation is more meaningful in decentralised units since managers can use the information obtained through participation for resource allocation among the operating units. Despite its importance, as a conditional factor for the success of participation in the budgetary process, it is surprising that no empirical study, that the authors are aware of, has evaluated the influence of decentralisation in the BPP relationship. Thus, the objective of this study is to test the moderating effects of decentralisation in the BPP relationship.

Hypothesis formulation

Decentralisation, which in this study refers to the extent to which decisions are taken by senior and middle level managers rather than top managers, is an important organisational control tool (Nadler and Tushman, 1988, pp. 110–115). In a highly centralised organisation, most decisions are taken centrally by top management with senior and middle managers having little decision-making responsibilities. These senior and middle level managers, who have little discretion as to how they are to operate, are expected to run their units according to various procedures and policies. In decentralised structures, on the other hand, top management delegates authority and responsibilities to subordinate managers who are given various kinds of decision-making powers. One important point to note, however, is that the organisation selects a particular level of decentralisation as a control device in response to the need for processing information among organisational units, groups or individuals who are closest to the work being done.

The empirical question, using a contingency framework, is whether participation in the budgeting process will be effective for both centralised and decentralised organisations. The available theory suggests that the effectiveness of budget participation may be dependent on the level of decentralisation. In centralised units, decisions are taken centrally and managers are constrained by various rules, procedures and policies that govern their operations. There is also a lower incidence of non-programmed decision-taking, in which case there is less reliance on managers' judgment and input into the planning process. Any attempt at participation in the budgetary process is unlikely to succeed since the organisational climate that follows a centralised structure does not facilitate the dissemination of information and the spirit of budget participation. On the other hand, in a decentralised organisation, where senior and middle managers are given more decision-making authority and there is a free flow of information at all levels, participation is more likely to succeed. Further, the literature suggests that decentralisation is an organisation's response to environmental uncertainty

(Galbraith, 1973). As such, for those decentralised organisations that are presumably faced with relatively high levels of environmental uncertainty, participation in decision-making would be expected to be more effective. In order to cope with high environmental uncertainty, managers need to have access to more information and be given more decision-making responsibility. This state of affairs in the organisation's decision-making process is conducive to successfully implementing budgetary participation. This line of reasoning is consistent with the following point made by Emmanuel et al. (1990):

'Participation is therefore not a universal panacea, but can be *selectively* useful in helping promote commitment to organisational goals. It is perhaps most useful in *decentralised* organisations ... (p. 175).

The discussion, thus far, posits that budgetary participation is more likely to succeed in decentralised organisations than in centralised organisations thus suggesting an interactive relationship. Moreover, as pointed out by Otley (1980), these control mechanisms (i.e. decentralisation and budgetary participation) are interdependent and may interact to form an overall control package. These arguments suggest the following hypothesis:

H1: The effects of budgetary participation on managerial performance will be positive in decentralised organisations and negative in centralised organisations.

Figure 1 attempts to depict the expected relationships.

Methodology

A field survey method was adopted whereby the data were obtained through questionnaires which were distributed to managers in selected manufacturing companies. Before distributing the questionnaires, a pilot study was conducted by requiring several colleagues and managers to complete the questionnaires. No changes were required to the questionnaire and none of the managers in the pilot study participated in the final study.

Sample Size and Data Collection

The personnel, operation and marketing managers of 26 different manufacturing companies in Hong Kong were personally approached by the researchers to assist with questionnaire distribution and participation in the study. A total of 170 questionnaires were distributed to Chinese managers of which 54 were returned representing a response rate of 32%. There were 11 supervisors, 20 middle managers and 17 senior managers with six respondents who did not fully complete the questionnaires and did not report their positions.

Figure 1
Relationship Between Participation, Decentralisation and Performance

	Decentralised	Centralised
High participation	High performance	Low performance
Low participation	Low performance	High performance

Table 1
Descriptive Statistics

<i>Variables</i>	<i>Mean</i>	<i>S.D.</i>	<i>Actual range</i>	<i>Theoretical range</i>	<i>Alpha Cronbach</i>
Managerial performance (Y)	6.97	0.79	4.00–8.00	1.00–9.00	NA
Budgetary performance (X ₁)	2.85	1.37	1.00–5.83	1.00–7.00	0.89
Decentralisation (X ₂)	3.91	1.16	1.60–6.20	1.00–7.00	0.63

Since the study focused on managers¹, the responses from supervisors were ignored, leaving a total of 37 managers' responses which were used for data analysis. Since some of the respondents' identities were not disclosed, it was not possible to test for non-response bias. The mean age of the respondents was 30 (range 26–56) and mean experience in their present companies was 12 years (range 1–35).

Measurement of Variables

Managerial performance was measured using a self-evaluation questionnaire developed by Mahoney et al. (1963). Respondents were asked to rate on a seven-point scale their own perceived performance on an overall rating plus ratings on the eight sub-dimensions of planning, investigating, coordinating, evaluating, supervising, staffing, negotiating and representing (Brownell and Hirst, 1986; Gul, 1991). Following the procedures adopted by Brownell and Hirst (1986, p. 243), the overall rating was validated by regressing it on the sub-dimensions. The regression explained 66% of the variance in the overall rating which compares favourably with that of Mahoney et al.'s (1963) work which suggests that the R-square should be in the region of 55%. Although there is some criticism regarding the use of this subjective measure, empirical evidence suggests that such concern is

unwarranted (Venkatraman and Ramnujam, 1987; Heneman, 1974). Decentralisation was measured in terms of an instrument developed by Gordon and Narayanan (1984) which contained five questions regarding the extent to which authority has been delegated to appropriate senior managers for five classes of decisions: development of new products and services; hiring and firing of managerial personnel; selection of large investments; budget allocations; and pricing decisions. Each item was measured on a seven-point scale with the low end of the scale representing a centralised structure and the high end representing a decentralised structure. Budgetary participation was measured by using Milani's (1975) six item measure (Brownell, 1982b). The items measure respondents' perceptions of the amount of influence and involvement that an individual manager has on a jointly-set budget.

Table 2
Correlation Matrix

<i>Variable</i>	<i>Y</i>	<i>X₁</i>	<i>X₂</i>
Managerial performance (Y)	1.00		
Budgetary participation (X ₁)	0.28	1.00	
Decentralisation (X ₂)	–0.45*	–0.23	1.00

*p = 0.01

¹These managers would, in the Hong Kong context, not be regarded as top managers, but rather as senior and middle managers. CEOs and directors are regarded as top managers. In the UK, however, the term senior manager is often used interchangeably with the term top manager.

Table 3
Regression Results: The Effect of Decentralisation on the Relationship between Budgetary Participation and Managerial Performance

Variables		Coefficient	Coefficient value	Standard error	F Stat. value	Significance p
X ₁	Budgetary participation	β_1	-1.02	0.33	9.33	0.004
X ₂	Decentralisation	β_2	-0.49	0.27	3.27	NS
X ₁ X ₂	Interaction term	β_3	0.22	0.08	5.92	0.025

Adjusted R² = 34%; F = 5.84; p < 0.002
N = 37

Previous use of this measure has resulted in satisfactory measures of both convergent validity and internal reliability (Brownell and Hirst, 1986).

Construct validity for the measures was assessed by factor analysis (using varimax rotations). Factor analysis yielded one factor each for budget participation and decentralisation with eigen values greater than one. Single scales were constructed by averaging a respondent's scores over the questions pertaining to budget participation and decentralisation. Reliability of the scales was estimated using Cronbach's alpha for internal consistency of the items. Descriptive statistics in terms of the average scores for the independent variables and the overall performance rating for the dependent variable are given in Table 1. Correlation matrix for the variables is given in Table 2.

Data analysis

Multiple regression was used as the method of analysis for this study. It is considered appropriate because it can take into account a single dependent variable and multiple independent variables in a single predictive model. In addition to the above flexibility, the interaction effects of the independent variables on the dependent variable can be captured in the multiplicative term in the multiple regression model.

To test H1, the following multiple regression model is employed:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_1 X_2 + e$$

where

Y = Managerial performance

X₁ = Budget participation

X₂ = Decentralisation

X₁X₂ = Interaction term

H₁: $\beta_3 \neq 0$

The above interaction term is expressed as the cross-product '... occurring between independent variables in their effects on the dependent variable' (Southwood, 1978, p. 1,155). It is considered an acceptable way of testing for interaction in the

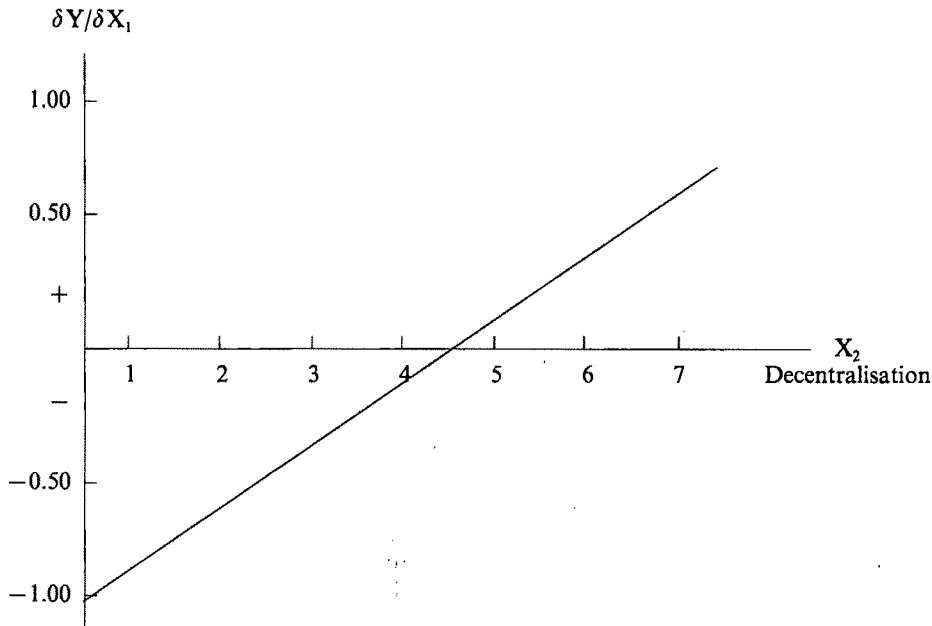
multiple regression model. If the β for the interaction term does not equal 0, this implies that the interaction is significant. For a significant interaction, it is insufficient to examine only the interaction term (Schoonhoven, 1981; Gul and Tsui, 1994) since algebraic sign of the interaction term only gives an indication of whether the effects are in the hypothesised direction. It does not give sufficient information about the nature and form of the interaction relationship. A partial derivative is graphed from the main regression equation in order to determine the nature and direction of the interaction (i.e., whether a symmetrical or non-monotonic relationship exists). It should also be noted that since the hypothesis focuses on testing the interaction effect between budgetary participation and decentralisation on managerial performance, the main effects of the above independent variables on the dependent variable are not interpreted. It appears in the literature that multicollinearity in multivariate models, such as this, may pose a problem but it is clear that when the interaction term is the focus of the study, such as in this case, the concerns regarding multicollinearity are unwarranted² (Gupta and Govindarajan, 1986; Govindarajan and Fisher, 1990; Gul and Tsui, 1994).

Discussion of results

The results presented in Table 3 show that there is a significant interaction in the predicted direction between budgetary participation and decentralisation (p < 0.025). The multiple regression model also explains 34% of the variance (F = 5.84, p < 0.002). Therefore, these findings indicate that the greater the level of decentralisation, the greater the positive effect that budgetary participation has on managerial performance.

²It is argued that through a priori linear shifts in the origin points of X₁ and X₂, the correlations between X₁X₂ and both X₁ and X₂ can always be reduced to zero. Since it is mathematically proven that these represent mere shifts in the origin points of X₁ and X₂, they are meaningless and do not affect the information value of X₁X₂. As such, multicollinearity is a non-issue.

Figure 2
The Effect of Decentralisation (X_2) on the Relationship Between Budgetary Participation and Managerial Performance



where Y = Managerial performance

X_1 = Budget participation

X_2 = Decentralisation

$$\begin{aligned}\delta Y / \delta X_1 &= \beta_1 + \beta_3 X_2 \\ &= -1.02 + 0.22 X_2\end{aligned}$$

$$\begin{aligned}\text{Point of inflection on } X_2 &= -\beta_1 / \beta_3 \\ &= 4.6\end{aligned}$$

In order to obtain more information as to the nature and impact of the interaction between decentralisation and budgetary participation, partial derivative of the regression equation was graphed (Figure 2). As pointed out by Govindarajan (1986), the interaction term in the multiple regression equation needs to be elaborated mathematically and displayed graphically to properly test the contingency hypothesis. It is necessary to obtain a clearer understanding as to whether X_1 has a non-monotonic or monotonic effect on Y . If the partial derivative of Y over X_1 is both positive and negative over the entire range of X_2 , then X_1 would be seen to have a non-monotonic effect over Y (Gupta and Govindarajan, 1986; Schoonhoven, 1981). On the other hand, if the partial derivative of Y over X_1 does not change direction within the range of X_2 , then the relationship between Y and X_1 would be regarded as monotonic.

Figure 2 shows the interaction effects between

decentralisation and budgetary participation on managerial performance. The vertical axis represents the effects of budgetary participation (X_1) on managerial performance (Y). The horizontal axis shows the range of level of decentralisation (X_2). The plotted line indicates the change in managerial performance given a change in budgetary participation over the entire range of the variable decentralisation. As seen from Figure 2, there exists a non-monotonic relationship between decentralisation and budgetary participation on managerial performance. This suggests that there is a positive relationship between budgetary participation and managerial performance only at higher levels of decentralisation (beyond the inflection point of 4.6). At low levels of decentralisation (more centralisation), there is a negative relationship between participation and managerial performance. In other words, for more centralised organisations, participation is associated with lower levels of

managerial performance whereas in decentralised organisations, participation is associated with higher levels of managerial performance. This result is consistent with Hypothesis 1 which posits that the effects of budgetary participation on managerial performance depend on the level of decentralisation.

The above results support the hypothesis that the level of decentralisation moderates the effect of budgetary participation on managerial performance. This provides further support for Brownell's (1982a) argument that participation in the budgetary process might be contingent on one of the four groups of variables, in this case, the organisational variable, decentralisation, which is seen as a significant control mechanism. These results are also consistent with Otley's (1980) suggestion that decentralisation and budget participation which form an overall control package would interact with each other to affect managerial performance. Thus, organisational designers should consider the notion that control packages are interdependent and that the selective implementation of any one control strategy (e.g. decentralisation) is unlikely to be successful unless one or more of the other complementary control strategies (e.g. budgetary participation) are also implemented. This study focused on participation and decentralisation but there are other variables such as budget incentives, budget evaluation styles and other measures of performance such as return on investment and job satisfaction which should be systematically evaluated from the point of view of theory development.

This study is subject to the usual limitations of questionnaire survey methodology (Birnberg et al., 1990). The selection of subjects was not random and generalising the results to other organisations should be viewed with caution. The use of respondents' perceptions to measure the variables has been criticised on the grounds that they are not objective. This is not a serious limitation since managers' actions and decisions are based on their perceptions.

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Contents

Editors

James Guthrie and Lee Parker

Abstracts and Keywords

Reappraising the Genesis of Managerialism: A Re-examination of the Role of Accounting at the Springfield Armory, 1815-1845

Keith Hoskin and Richard Macve

Financial Reporting Quality Labels: The Social Construction of the Audit Profession and the Expectations Gap

Tom Lee

Accountability and Accounting: Using Naturalistic Methodology to Enhance Organizational Control—A Case Study

Andrew Goddard and Jackie Powell

Finding English Words to Talk about Accounting Concepts

R.H. Parker

Respondent Lobbying in the Australian Accounting Standard-setting Process: ED49—A Case Study

Irene Tutticci, Keitha Dunstan and Scott Holmes

Book Reviews

Journal of Business Finance & Accounting

December 1994

Editor: Richard Briston

Vol. 21 No. 8

Contents

The Determinants of Audit Fees: Some Empirical Models

by C. M. PONG AND G. WHITTINGTON

Measurement/Valuation-Related Interpretations of Fundamental Accounting Concepts

by DON VICKREY

Financial Ratio Adjustment Dynamics and Interest Rate Expectations

by CARL R. CHEN AND FALL AININA

Earnings Signals and Inter-Firm Information Transfers

by JAMES W. BANNISTER

Accounting Practice and Business Finance: Some Case Studies from the Iron and Coal Industry 1865–1914

by JOHN RICHARD EDWARDS AND TREVOR BOYNS

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An Evaluation of the Decision Usefulness of Cash Flow Statements by Australian Reporting Entities

Stewart Jones, Claudio A. Romano and Kosmas X. Smyrniotis*

Abstract—In June 1991, the Australian Accounting Standards Board issued AASB 1026, *Statement of Cash Flows*. Since replacing the funds flow statement, the new accounting standard has become a compulsory part of Australian corporate financial reporting. In contrast to cash flow developments in the US and UK, the emergence of AASB 1026 has been preceded by almost no significant research attention by Australian academics. This study surveyed the attitudes to cash flow statements of 210 public companies listed on the Australian stock exchange. Findings revealed that there was particularly strong support for the essential provisions of AASB 1026 and the underlying principles of cash flow reporting. The results indicated that the cash flow statement is important for a wide variety of internal and external decision contexts, and appealed to a wide range of users. Furthermore, compared with previous research (e.g. McEnroe, 1989), the present survey demonstrated that operating profit was not considered by a large number of Australian companies to be a superior measure of business performance to operating cash flow.

Introduction

In June 1991, Australia's official standard-setting body, the Australian Accounting Research Foundation (AARF) issued a cash flow standard on behalf of the Australian Accounting Standards Board (AASB). All public companies were required to comply with the new accounting standard by no later than June 1992. The accounting standard covering the funds flow statement ASRB 1007, *Financial Reporting of Sources and Applications of Funds*, was simultaneously withdrawn in June of 1992. With the release of AASB 1026, Australia joined an increasing number of western countries that have adopted accounting standards on cash flow statements. Cash flow standards were issued in the US (FAS 95) in November 1987; in the UK (FRS 1) in September 1991; in New Zealand (SSAP 10) in October 1987; and in South Africa (AC 118) in July 1988.¹

While the cash flow statement (CFS) has, for some time now, been on the agendas of international standard-setting bodies, the development of Australia's interest in the issue has been both belated and haphazard. The shift in Australian corporate and regulatory opinion to the importance of CFSs in the late 1980s and early 1990s can be directly attributed to an unprecedented increase in the number of corporate collapses during this period (Lawson, 1991; Lyons, 1991). In light of numerous company collapses, auditing and accounting professions in Australia became the target of public criticism. Without doubt, these developments had an impact on the growing interest in CFSs (Walker and Robinson, 1992).²

In contrast to cash flow developments in the US and UK, there has been very little systematic empirical research on the importance of CFSs

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¹There are a number of minor differences between AASB 1026 and its international counterparts. However, the most important substantive difference relates to the direct method of reporting cash flow information. AASB 1026 mandates the direct method, whereas all other cash flow standards (with the exception of SSAP 10) either allow both the direct and the indirect method, or merely encourage adoption of the direct method. It is well recognised in the literature (see for example Heath, 1978, 1987; Drtina and Largay, 1985; Klammer and Reed, 1990) that the indirect method greatly undermines the relevance and mission of the cash flow statement.

²It is noteworthy that the introduction of a cash flow standard in Australia was not, at first, an initiative taken by the accounting profession. According to Walker and Robinson (1992), introduction of this initiative came from pressures applied by the Australian stock exchange (ASX). Prior to the ASX decision to fast track cash flow reporting regulations in November 1990, the AARF and the AASB were committed to the funds flow statement and improving its format and presentation. For instance, ASRB 1007 (which was first issued in 1986) was revised and reissued in November 1990 to require presentation of cash flows from operations (ASRB Media Release, 12 November 1990). It is noteworthy that a few weeks after the announcement of the ASX plans to develop regulations on cash flow statement, the AARF's long-standing commitment to funds flow reporting was dramatically reversed (see AARF Media Release, 21 December 1990). In its place, the AARF announced its intentions to issue an exposure draft on cash flow reporting.

in Australia.³ As a result, the relevance and utility of the CFS to the economic decision-making of users is yet to be demonstrated empirically in this country. There are several reasons why the present study is relevant in an international context. First, the study contrasts observations on cash flow reporting previously conducted in the US and UK. The Australian environment provides another important 'replication' test bed by which the growing international movement towards cash flow reporting can be continually assessed and contrasted. For example, the widespread support for the direct method of reporting cash flows by Australian businesses represents a significant departure from cash flow developments in the US and UK. Second, many international studies on CFSs (e.g. Lee, 1981a) were undertaken prior to the introduction of formal cash flow regulations. Many studies conducted during the 1980s attempted to verify pragmatic concerns that practitioners would be confronted with on the introduction of cash flow reporting requirements.

The present study surveys attitudes to CFSs in the context of, and after the introduction of, specific mandatory cash flow regulations. This provides a more purposeful, informative and tangible context for measuring and evaluating commercial attitudes to CFSs. Furthermore, differences in environmental and commercial conditions (e.g. worldwide recession and corporate collapses) between studies conducted during the 1980s (e.g. Lee, 1981a; McEnroe, 1989) and the present study could provide important insights which explain widening international support for the CFS, particularly in Australia. Third, some leading empirical studies, notably Lee (1981a) and McEnroe (1989), focused attention on a narrow range of users, that is, accountants and audit partners. This study aimed to gauge the strength of support for the CFS from respondents who represented a wide variety of commercial backgrounds and occupations and were primarily *preparers* rather than users. This focus provided a broader and more stringent basis for assessing commercial attitudes to the CFS. After all, given the conventional wisdom that preparers would not wish to disclose hard accounting data (such as CFSs) the results of the present study have proven counter-intuitive.

The present study evaluated whether the introduction of AASB 1026 was likely to lead to a significant improvement in the quality of financial reporting for decision-making and identified critical variables for further research. Specifically, this study identified commercial attitudes to the CFS,

potential users of CFSs, and decision contexts in which CFSs are utilised by decision makers. Furthermore, the present study compared the utility of the cash flow versus funds statements in terms of user preferences and decision usefulness functions. Deriving empirical research data on these issues is critical for evaluating the wisdom of the AASB's policy decision to replace the funds statement with the CFS; gauging the present and future direction of the CFS in this country; and identifying issues warranting further research attention.

The remainder of the paper is as follows: the second section discusses AASB 1026 in the context of literature relating to the emergence of CFSs in relevant international accounting jurisdictions; the third section provides a description of the methodology; and section four involves a discussion and explanation of results. The final section provides concluding remarks.

Background

This section briefly discusses AASB 1026 in the context of relevant literature that has spearheaded the emergence of the CFS in international accounting jurisdictions.

The Cash Flow Versus Funds Statement Debate

Release of FRS 1 and FAS 95 was preceded by considerable academic interest and research into the relative merits of cash flow and funds flow statements. The theoretical development and analytical refinement of modern cash flow reporting, from the late 1960s to the early 1980s, can be attributed to both Lee and Lawson (see Ashton, 1976; Lawson, 1992; Lee, 1981b, 1986 and 1993). Furthermore, Neill et al. (1991) and Lee (1993) have collected and synthesised much of the contemporary cash flow literature.

While the CFS has been explicitly regarded by accounting standard setters as a replacement to the funds statement, there are no extant Australian studies that have compared, empirically, the relative merits of both financial statements on a range of decision usefulness issues. In fact, advocacy of CFSs and cash flow reporting has been closely associated with the limitations of accrual accounting procedures, not necessarily with specific problems associated with funds statement preparation or the intrinsic usefulness of the CFS. Limitations of accrual measurement processes, especially with respect to the subjective and arbitrary nature of allocations, are seen to be particularly manifest in the determination of corporate earnings (see, for example, Rappaport, 1982; Heath, 1978; Brealey and Myers, 1984; Healy, 1985; DeAngelo, 1986). Lee and Lawson identified many limitations of accrual accounting which the CFS seemingly avoids (see Lee, 1993, pp. 72-74 for a detailed summary).

³A review of several Australian accounting journals, including *Abacus*, *Accounting and Finance*, the *Australian Accounting Review*, *Accounting Forum*, and *Accounting Research Journal* reveals that, over the past 12 years, only eight manuscripts have been published on cash flow reporting.

For example, the CFS does not rely on allocations used in accrual accounting procedure and thus, provides a relatively unambiguous measure of performance; avoids some of the problems associated with changing price levels which can distort conventional historical cost accounts; emphasises the fundamental importance of cash resources, and solvency and liquidity issues to the continuing life of an enterprise; is capable of producing data which is needed for a wide variety of decision and control activities both within and without the reporting entity; and has many benefits because of its relative simplicity, objectivity, and understandability.

Some studies (e.g. Lee, 1983) have specifically explored the dualism between cash flow and funds statements. According to Heath (1978a), the main problem with the funds statement is that it attempts to achieve too many unattainable objectives. Heath (1978a, p. 94) noted that the fund statement is merely 'a hodgepodge of miscellaneous information presented in a misleading and confusing way'. Hence, the statement might be of limited relevance to user needs. In addition, concerns have been expressed that the usefulness of the funds statement is undermined because it provides essentially the same information as the balance sheet, and profit and loss account, but with a different emphasis (Dearden and Shank, 1975). In contrast, a number of studies (see Buzby and Falk, 1974; Clemente, 1982; Gibson, Klammer and Reed, 1986; Nurnberg, 1983; Ketz and Largay, 1987) do not consider the issue of funds statement preparation to be a dead issue. These investigators have suggested ways of improving the structure and presentation of the funds flow statement, an issue that will be explored later in this paper.

Users of Cash Flow Statements

In a synthesis of some leading cash flow studies, Neill et al. (1991) emphasised the importance of cash flow data for decision-making purposes. The theoretical foundation of Lee's (1971, 1972a and 1972b) support for CFSs is based on the principles of utility and relevance. That is, CFSs are viewed as fundamentally providing relevant information to users for resource allocation decisions. While Lawson (1972, 1975a and 1978) has evaluated the usefulness of CFSs for a variety of user groups, his research attention has mainly focused on the information needs of investors (see also Climo, 1976).

Lee (1974, 1978 and 1979) demonstrated the relevance of CFSs to a number of specific user

groups, including creditors, bankers, employees, managers and government bodies. Furthermore, Lee (1981a and 1981b) demonstrated the general purpose nature of CFSs, and its ability to satisfy a wide range of users. It is noteworthy that the findings of McEnroe (1989) are consistent with those of Lee (1981a).

Since the seminal works of Lee and Lawson, most studies have taken an investor focus by testing share market behaviour to cash flow disclosures. Most of these studies (see, for example, Wilson, 1987; Bernard and Stober, 1989; Board and Day, 1989; Livnat and Zarowin, 1990) assessed whether cash flow data had incremental information content over and above periodic earnings announcements. While some of these studies indicated that cash flow information possessed explanatory power in addition to earnings announcements, other studies (see Neill, 1991; Lee, 1993) have yielded either conflicting or inconclusive results.

Method

Subjects

Subjects were 210 representatives of companies listed on the Australian stock exchange. Initially, questionnaires were forwarded to 500 randomly selected Australian listed public companies [N = (approximately) 1,200]. The sample was generated randomly from the Sales Scan database (Dun and Bradstreet, 1990). Sales Scan contains business addresses for all Australian listed companies with a sales turnover of A\$2m or greater, and includes the top 25,000 businesses. Listed companies were sampled because these entities are legally required by the Australian Corporations Law to comply with AASB accounting standards. Furthermore, listed companies represent the largest and most economically significant element of the corporate private sector. In order to minimise the effects of random sampling error, a large sample of companies was used in relation to the total population of listed companies.

Respondents involved five distinct groups: corporate financial accountants (n = 12), accounting policy managers⁴ (n = 133), senior finance executives (n = 6), financial controllers (n = 17), and company directors/secretaries (n = 42). The majority of respondents held senior positions in their organisation. Respondents generally had considerable financial reporting experience. The average internal reporting experience of respondents exceeded 11 years and external reporting experience (i.e., reporting to outside user groups) ranged between six and 10 years. Respondents were associated with five broad industry groups: manufacturing (n = 59); retail/wholesaling (n = 18); mining (n = 55); banks and financial institutions (n = 13); and transport, communications and other

⁴The term accounting policy managers is a general classification for members in an organisation associated with the preparation and use of financial statements. These include corporate accountants (n = 75), accounting sales managers, financial managers, treasury managers, and managers of finance and administration (n = 58).

($n = 65$). These proportions reflect the actual industry concentration in Australia which is made up of a large percentage of manufacturing and mining companies. In terms of company size, sales turnover of respondent companies averaged between A\$100m and A\$300m, and total asset size averaged between A\$100m and A\$300m.

Measure

For the purposes of this study, a cash flow and fund statement questionnaire (CFFSQ) was developed. A number of Lee's (1981a) questions relating to respondent characteristics, user groups and decision-making functions of the CFS were used in this survey. The CFFSQ comprised 124 questions. Most closed-ended questions were rated on 5-point Likert scales ranging from 'strongly agree' to 'strongly disagree'. Questions were grouped into five broad sections: respondent characteristics (e.g., occupation, reporting experience, main financial reporting responsibilities to external users); company characteristics (e.g., company size, industry membership); decision contexts (i.e., respondents rated 20 decision contexts that cash flow and funds statements were used for); and primary users of cash flow and funds statements. Also investigated were a number of other items, including problems that users encountered with the funds statement, and the relative merits of operating cash flow versus operating profit as a business performance measure.

A covering letter outlined the purpose of the research and defined the CFS in the context of the definitions, format, and classifications adopted in the Australian accounting standard AASB 1026, *Statement of Cash Flows*. Similarly, funds flow statements were defined in the context of the definitions, format and classifications adopted in the Australian accounting standard ASRB 1007, *Financial Reporting of Sources and Applications of Funds*.

Reliability of measure. The homogeneity of the CFFSQ and the degree to which all items measured one factor was established using Cronbach's alpha. When all items were subjected to a Cronbach's alpha, the standardised alpha reliability coefficient was greater than 0.9. This very high reliability level indicates that the CFFSQ was likely to be measuring a single factor (Cohen, Montague, Nathanson and Swerdlik, 1988).

Procedure and Response Rate

Questionnaires were mailed to subjects who were invited to complete and return them in stamped self-addressed envelopes. The response rate, after deducting 21 unusable responses, was 42% ($n = 210$). Of the 21 unusable questionnaires, 15 companies indicated that it was their policy not to respond to requests to participate in surveys, the remainder were incomplete. It is to be noted that a further

36 questionnaires were returned because of wrong addresses.

Tests for non-response error. Non-response error was tested statistically by comparing the underlying characteristics of respondent companies with non-respondent companies. Of the 290 non-respondents, 50% ($n = 145$) were randomly selected from this group. These non-respondents were requested to answer, by telephone, a number of questions contained in the survey questionnaire. Using both non-parametric and parametric statistics, non-significant differences were found between respondent and non-respondent groups on industry membership; focus of financial reporting responsibility; opinions regarding the relevance of the CFS in various decision contexts; whether a CFS had been prepared by the organisation prior to the requirements of accounting standards; support for the direct method of reporting the CFS; and whether companies agreed with the AARF's decision to issue a CFS and withdraw the funds statement.⁵ Overall, these findings suggest that the respondent group was likely to be representative of the non-respondent group.

Results and discussion

This section of the paper examines the survey results concerning the usefulness of cash flow versus funds statements in Australia. Data were analysed using SPSS for Windows: Release 6.0 (Norusis, 1993). It should be noted that non-parametric statistics are reported in the body of this paper and equivalent parametric statistics including means, standard deviations, and t-tests are reported where appropriate. While it is uncommon to report both parametric and non-parametric statistics, the parametric descriptive statistics provide valuable information that are obscured by the non-parametric descriptive tests (e.g., median scores). Finally, it is noteworthy that all parametric statistics were consistent with those of non-parametric equivalents.

In relation to main financial reporting responsibilities to different user groups (in order of magnitude) 97.4% of respondents reported to managers/executives of their own company; 95.3% were to banks; 84.6% were to others (e.g., suppliers, employees, major customers); 74% were to lenders; 68.7% of respondents were to shareholders; 65.5% were to parent companies; and 56.3% were to potential investors. Further analysis revealed that all companies reported to at least four user groups.

⁵There were statistically significant differences between groups in the occupational and financial reporting experience of respondents ($ps < 0.05$). The non-respondent group tended to have relatively more experienced respondents with specialist occupations in accounting/finance disciplines. Neither of these results would suggest that the respondent group is not representative of the non-respondent group.

Table 1
Mean and Median Scores, Standard Deviations^a and Range in Scores on Ratings of Usefulness of the Direct Method of Reporting Cash Flows

<i>Item</i>	<i>Mean score (n = 200)</i>	<i>Median score (n = 200)</i>	<i>Range in scores</i>
The direct method:			
Helps users understand cash flow data	2.34 (0.70)	2	1-4
Facilitates cash flow analysis	2.35 (0.68)	2	1-4
Is a better indicator of company solvency	2.68 (0.71)	2	1-4
Has a sounder conceptual basis	2.42 (0.64)	2	1-4
Reflects accepted commercial practice	2.67 (0.74)	3	1-4

Note. ^aStandard deviations in parentheses. Lower mean and median scores indicate higher ratings of usefulness (i.e., 1 = strongly agree; 5 = strongly disagree).

These results indicate that Australian companies have financial reporting responsibilities to a variety of internal and external user groups. This high variability in major reporting responsibilities was also reported by Lee (1981a). While Lee (1981a) noted the importance of banks as a major focus of reporting responsibility, the present results indicate that reporting responsibilities to internal users figured prominently, as did 'other' user groups such as suppliers and employees. This difference can possibly be explained in terms of the average size of companies being considerably larger in this survey than those reported by Lee. Larger companies are more likely to be associated with a more significant concentration of external and internal users than smaller companies (cf. Watts and Zimmerman, 1986).

Attitudes to AASB 1026 and the Withdrawal of the Funds Statement

Seventy-six percent of respondents (n = 160) supported or strongly supported the AARF's decision to implement a cash flow standard and remove the funds flow statement. Only 4% disagreed with the decision. As expected, 91% of respondents (n = 191) opposed the notion that companies should be required to disclose both a cash flow statement and a funds flow statement. Furthermore, 57% (n = 120) of respondents had been preparing CFSs for internal reporting purposes prior to AASB 1026 regulatory requirements. Surprisingly, CFSs were being prepared by companies for internal reporting purposes for an average of 10 years prior to the release of AASB 1026. These findings indicate that utility of CFSs, at least for internal reporting purposes, has been long established in Australia.

Companies that had already been preparing CFSs for a considerable length of time had some distinctive characteristics. Eighty-two percent of larger companies (A\$500m in sales turnover or greater) had already been preparing CFSs as opposed to only 40.5% of smaller companies (A\$50m in sales turnover or less). The results also showed that

a much higher proportion of manufacturing and mining companies were preparing CFSs prior to AASB 1026 than all other industries combined. Furthermore, companies already preparing CFSs consistently rated internal users (in particular, parent companies and managers/executives) to be their major reporting responsibility.

However, CFSs prepared by companies prior to release of AASB 1026 were significantly different from the requirements of AASB 1026. For instance, very few companies adopted the direct method of preparing CFSs for internal reporting purposes. There was also variability in definitions of cash employed; classifications of financing, operating and investing activities; and in the format of the CFS. The present survey indicated that nearly all companies were satisfied with the requirements of AASB 1026⁶ and the majority of companies were experiencing no difficulties complying with the provisions of the standard.

It is noteworthy that this survey revealed widespread support for the direct method of reporting cash flows, despite the greater time and cost involved in using this method. In particular, the majority of respondents indicated that the direct method helps users understand cash flow data; facilitates cash flow analysis; is a better indicator of company solvency; has a sounder conceptual basis; and reflects accepted commercial practice (see Table 1 for mean and median scores, and standard deviations and range in scores on ratings of usefulness of the direct method of reporting cash flows). The survey also revealed that cash flow from operations (a measure derived by use of the

⁶However, 60.2% of respondents indicated that usefulness of the cash flow statement would be significantly enhanced if supplemented by forecast cash flow information. In contrast, Lee (1981) reported that only 42% of respondents were favourably disposed to forecast reports. This difference can perhaps be explained in terms of substantially increased support by Australian companies for the underlying principles of cash flow reporting, and academic and media attention given to cash flow reporting in the past decade.

Table 2
Rankings of Rating of Importance of Cash Flow Measures Based on Mean and Median Scores

<i>Cash flow measure</i>	<i>Mean^a score (n = 197)</i>	<i>Median score (n = 197)</i>	<i>Range in scores</i>
Cash flow from operations	1.63 (1.09)	1	1-5
Net change in cash balance	2.23 (1.172)	2	1-5
Cash flow from investment	2.49 (0.998)	2	1-5
Working capital from operations	2.51 (1.03)	2	1-5
Net income + depreciation and amortisation	2.67 (1.092)	3	1-5

Note. ^aStandard deviations in parentheses. Lower mean and median scores indicate higher ratings of usefulness (i.e., 1 = strongly agree; 5 = strongly disagree).

direct method under AASB 1026) was rated as the most important cash flow measure by respondents.

Table 2 shows rank ordering of ratings based on mean and median scores of importance of cash flow measures. It is noteworthy that crude measures of cash flow (net income + depreciation and amortisation), which are readily derived under the indirect method, received the lowest ratings of importance (see Table 2). Again, these results indicate strong support for the direct method. It is interesting to observe that respondents rated changes in net cash balance as an important cash flow measure (see Table 2). This result ties in with public responses to exposure draft ED 52, *Statement of Cash Flows*, May 1991. Nearly all the 53 public companies that commented on the provisions of ED 52 strongly supported the inclusion of a reconciliation statement that would identify the difference between operating profit and net cash balance resulting from various accrual items. It is likely that this measure of cash flow was rated as important for this very reason.

Usefulness of Cash Flow Versus Funds Statements for Decision-making

The importance of CFSs for different decision-making contexts is still in a process of development. For instance, considerable efforts have been made to emphasise the decision-making relevance of cash flow data for assessing going concern enterprise performance and identifying financially distressed firms (see Neill et al., 1991). So far much of this research has yielded largely inconclusive findings. While Lee (1981a, 1981b and 1993), Lawson (1992) and others (see, for example, Ashton, 1976; Giacomino and Mielke, 1987; Wise and Wise, 1988; Gibson, Klammmer and Reed, 1986; Charitou and Ketzi, 1991; Currie, 1987) have suggested a number of decision contexts in which cash flow information is important, there is still comparatively little empirical research that can delineate those decision factors which are more critical to users' resource allocation decisions.

The present findings indicated that, when compared with the funds statement, respondents

Table 3
Mean and Median Scores, Standard Deviations^a and Range in Scores on Ratings of Why Cash Flow Statements are More Relevant and Important than the Funds Statements

<i>Cash flow statement</i>	<i>Mean score (n = 209)</i>	<i>Median score (n = 209)</i>	<i>Range in scores</i>
Is more understandable	2.100 (0.988)	2	1-5
Is easier to interpret	2.105 (1.011)	2	1-5
More relevant to decision-making by external users	2.163 (0.824)	2	1-5
More relevant to planning and decision-making by your company	2.327 (1.01)	2	1-5
Satisfies information needs of a wider range of users	2.333 (0.838)	2	1-5
More relevant to a wider range of internal decisions	2.410 (0.965)	2	1-5
Less problems with definition of key terms	2.438 (0.932)	2	1-5
Provides greater degree of comparability between companies	2.524 (0.895)	3	1-4
Fewer problems with terminology	2.543 (0.918)	2	1-5

Note. ^aStandard deviation in parentheses. Lower mean and median scores indicate higher ratings of importance (i.e., 1 = strongly agree; 5 = strongly disagree).

considered the CFS as more understandable than the funds statement; easier to interpret; having fewer problems with the definition of key terms and terminology used; providing a greater degree of comparability between companies; satisfying the information needs of a wide range of users; and more relevant to a wider range of users' internal and external decisions. (See Table 3 for mean and median scores, and standard deviations and range in scores.) These findings, however, should be interpreted in the context of internal views and managerial perceptions.

In terms of the decision-making functions of the CFS, findings indicated that respondents rated the CFS as useful in a variety of different internal and external decision contexts. Non-parametric Wilcoxon tests (for two related samples) were used to evaluate the usefulness of cash flow and fund statements in terms of 20 different decision contexts derived from the literature. Decision factors are shown in Table 4. The decision contexts can

be grouped into five broad factors relating to: liquidity and solvency evaluation; performance evaluation; prediction functions; monitoring evaluation; and other. While it is acknowledged that there is some overlap across decision contexts and factors, this list is intended to be representative rather than exhaustive of the various uses of CFSs. Clearly, it would have been problematic to have included an exhaustive list of decision contexts without compromising the length of the survey.

Table 4 shows median scores, range in scores, Wilcoxon test and t-test statistics comparing ratings of importance of cash flow and funds statements. Statistical testing indicated that, for a wide range of internal and external decision areas, the CFS was rated by respondents as significantly more important than the funds statement. While the dominance of the CFS over the funds statement would be intuitively expected by many, the extent and range of this dominance was largely unknown before this study was undertaken.

Table 4
Median Scores, Range in Scores, Wilcoxon Test and t-test Statistics^f Comparing Ratings of Importance of Cash Flow and Funds Statements

Item	Cash flow statement		Funds statement		z statistic	t statistic
	Median	Range in scores	Median	Range in scores		
^a Ability to service debts	2	1-5	4	1-5	-10.04*	-15.10*
^a Ability to fund changes in the scope and nature of operations	2	1-5	4	1-5	-10.50*	-16.33*
^a Ability to pay dividends	2	1-5	4	1-5	-9.46*	-13.07*
^a Assess quality of net income	2	1-5	4	1-5	-8.59*	-11.05*
^a Highlight differences between net income and final cash balances	2	1-4	4	1-5	-8.74*	-11.15*
^a Liquidity evaluation	2	1-5	3.5	1-5	-10.08*	-15.43*
^a Obtain external finance	2	1-5	4	1-5	-10.35*	-15.84*
^a Solvency evaluation	2	1-5	4	1-5	-9.69*	-14.05*
^b Compare performance with other companies	3	1-5	4	1-5	-6.36*	-4.33*
^b Evaluation of managerial performance	3	1-5	4	1-5	-7.35*	-8.89*
^b Evaluation of overall company performance	2	1-5	4	1-5	-9.18*	12.68*
^b Evaluation of operating performance	2	1-5	4	1-5	-9.29*	-13.02*
^c Monitor fixed asset investment	2	1-5	3	1-5	-5.84*	-6.42*
^c Monitor changes in financial position	2	1-5	3	1-5	-8.19*	-10.35*
^c Monitor changes in working capital	2	1-5	3	1-5	-7.04*	-8.08*
^d Predicting financial distress	2	1-5	4	1-5	-9.65*	-13.42*
^d Predicting future cash flows	2	1-5	4	1-5	-8.88*	-11.89*
^e Capacity to adapt to changed conditions	2	1-5	4	1-5	-9.27*	-6.22*
^e Highlight cash and non-cash aspects of a company's financing and investing activities	2	1-5	4	1-5	-8.93*	-11.73*
^e Strategic planning	2	1-5	4	1-5	-9.73*	-14.04*

Note. ^aLiquidity and solvency evaluation. ^bPerformance evaluation. ^cMonitoring decisions. ^dPrediction evaluation. ^eOther decision factors. ^ft-test results were in line with those obtained from the non-parametric Wilcoxon procedures. Lower median scores indicate higher ratings of importance (i.e., 1 = strongly agree; 5 = strongly disagree). *p < 0.0001.

Notwithstanding that respondents' replies need to be interpreted in the context of managerial perceptions and internal viewpoints, several features of Table 4 seem noteworthy. First, respondents regarded CFSs as having significantly greater decision usefulness for evaluating liquidity and solvency factors than funds statements. Specifically, CFSs were considered useful for decisions about funding changes in the scope and nature of operations, obtaining external finance, servicing debts, evaluating solvency and liquidity, paying dividends, and assessing quality of income.

Second, Table 4 indicates that CFSs are significantly more useful than funds statements in evaluations of operating performance, managerial performance, overall company performance, and performance comparisons with other companies.

Third, the funds statement was viewed as inferior to the CFS for a number of monitoring and prediction purposes. In particular, significant differences were identified in terms of, *inter alia*, monitoring changes in financial position, monitoring working capital changes, monitoring fixed asset investment, and prediction of future cash flows and financial distress. Clearly, these findings demonstrate that the funds statements are ineffective when compared to CFSs in a number of areas of management evaluation.

It is noteworthy that the funds statement was not considered useful for any decision item described in the questionnaire. Furthermore, the CFS ranked as statistically more important than the funds statement on every decision item. These results are surprising considering that ASRB 1007, *Financial Reporting of Sources and Applications of Funds*, was substantially amended in 1990, requiring 'funds' to be redefined as 'cash and cash equivalents' and the presentation of cash flow from operations. The amendments effectively required a funds statement to be prepared on a purely cash basis of accounting (ASRB Media Release, 12 November 1990). These results are therefore consistent with overwhelming support for CFSs by the business community.

Further analysis of the decision contexts listed in Table 4 was conducted using a Friedman two-way ANOVA by ranks. The χ^2 statistic revealed significant differences in the mean rank scores of each of the decision contexts [$\chi^2(19, N = 200) = 331.34$, $p = 0.0001$]. Post hoc testing (using Wilcoxon tests) revealed that lower median scores tended to be concentrated around liquidity and solvency factors. In particular, the liquidity and solvency factors showed the greatest overall variation in mean rank scores from all other decision contexts (in order of importance): ability to fund changes in the scope and nature of operations; ability to obtain external finance; ability to service debts; solvency evaluation; liquidity evaluation; and assessing differences between net income and final cash balances. Post hoc

testing revealed that monitoring uses of CFSs had more overall importance to decision-making than prediction evaluation factors, and that prediction, monitoring and other factors were rated more highly for decision-making than performance evaluation factors.

These findings appear to confirm initial reasons why the CFS has now become so important in the Australian corporate reporting environment. These factors have been associated with the high incidence of corporate failure since the late 1980s and the subsequent concern by regulators and other parties with the liquidity and solvency of companies (Lyons, 1991). Lee (1981a) reported that the CFS was important for external decisions including evaluations of liquidity, quality of management, and financial results, and internal decisions, including managing working capital, making investment decisions, long-range planning, monitoring investment decisions, and dividend decisions. These findings are largely consistent with those of Lee.

In conclusion, there is little doubt that the CFS has comprehensively out-performed the funds statement as a significant document for economic decision-making. Furthermore, decision-makers have found the CFS useful in a wide variety of internal and external decision and control contexts, a point first noted by Lee (1981a and 1993) and Lawson (1970, 1975a and 1979) in advocating the importance of CFSs. Furthermore, Table 4 indicates that no particular decision context was rated with a mean score that was especially high or low. Hence, research concentrating on specific variables, such as financial distress prediction, might not be yielding significant or conclusive results because the decision focus of such studies is too narrow. The results of the present study indicate that the real strength of the CFS for decision-making lies in its dynamic flexibility and general purpose character.

Significant Users of Cash Flow and Funds Statements

Consistent with findings presented earlier, a wide range of users rated the CFS as more important than the funds statement. A detailed analysis of major users was conducted using a Friedman two-way ANOVA by ranks. This statistic was used to examine significant users of CFSs. (See for Table 5 for median scores, range in scores, Wilcoxon test and t-test comparisons of organisations' ratings of the usefulness of cash flow and fund statements.) The Friedman test revealed significant differences between users of CFSs [$\chi^2(6, N = 200) = 472.52$, $p = 0.0001$]. Post hoc testing (Wilcoxon tests) on CFS users indicated that bankers used CFSs significantly more than managers, institutional investors, shareholders, suppliers, employees and consumers. Furthermore, managers used CFS significantly more than institutional investors,

Table 5
Median Scores, Range in Scores, Wilcoxon Test and t-test Comparisons of Organisations' Ratings of Usefulness^b of Cash Flow and Fund Statements

Users	Cash flow statement		Funds statement		z statistic	t statistic
	Median (n = 200)	Range in scores	Median (n = 200)	Range in scores		
Bankers	2	1-5	3	1-5	-10.10**	-14.91**
Managers	2	1-5	3	1-5	-10.11**	-15.58**
Institutional investors	2	1-5	3	1-5	-9.43**	-13.07**
Shareholders	2	1-5	3	1-5	-8.15**	-10.40**
Employees	3	1-5	4	2-5	-5.43**	-6.28**
Suppliers	3	1-5	4	2-5	-6.38**	-7.44**
Consumers	4	2-5	4	2-5	-3.01*	-3.31*

Note. Lower median scores indicate higher ratings of usefulness (i.e., 1 = strongly agree; 5 = strongly disagree). *p < 0.001 **p < 0.0001.

shareholders, employees, suppliers and consumers. Institutional investors used CFSs significantly more than shareholders, employees, consumers and suppliers. Shareholders used CFSs significantly more than suppliers, employees and consumers; and suppliers were more significant users than employees and consumers. (See Tables 6 and 7, respectively, for post hoc Wilcoxon matched pairs signed-ranks test statistics for principal users of cash flows and funds statements. Post hoc t-test results were in line with those obtained from the non-parametric Wilcoxon procedures.)

The present findings indicated that CFSs ranked as considerably more important for the decision-making of all user groups than the funds statement. Major CFS users included bankers, managers, institutional investors and shareholders. While many companies indicated that they had reporting responsibilities to user groups such as employees, suppliers and consumers, these users were not viewed by respondents to make significant use of the CFS or of the funds statement. The importance attached to bankers, and their traditional monitoring concern with the liquidity and solvency of companies, is broadly consistent with ratings on the most important decision contexts for the CFS. Overall, results suggest that CFSs have considerable use for major internal and external user groups, but have some limitations as an all-encompassing general purpose financial report.

The findings of this study, taking into account differences in the survey design, are consistent with those of Lee (1981a) and McEnroe (1989). While Lee (1981a) reported percentages only, he found that, in order of ranking, bankers, lenders, institutional investors, private shareholders, employees, suppliers, government and consumers were perceived as the most frequent users of CFSs. McEnroe (1989) reported a very similar result. It is noteworthy that ratings of predominant users

of CFSs have not changed over time nor between international accounting jurisdictions.

Problems with the Funds Statement

The present quantitative findings demonstrate that CFSs have gained a decisive ascendancy over the funds statement as a primary financial statement. Furthermore, this study reveals general dissatisfaction with the utility of the funds statement for a variety of internal and external reporting purposes. Qualitative data further support these findings. Ninety-three percent (n = 195) of companies reported having no plans to continue preparing funds statements for either internal or external reporting purposes following withdrawal of the compulsory disclosure requirements of ASRB 1007. This result suggests minimal use of the funds statement for all decision-making purposes. In addition, 86% (n = 188) of respondents indicated that the funds statement could not be improved or restructured to make the document more relevant for decision-making. Furthermore, the majority of respondents agreed or strongly agreed with questionnaire items that the funds statement did not display critical information for decision-making; lacked any ultimate focus; was not relevant to a wide range of users; displayed weaknesses in format; had problems with its terminology; tried to achieve too many objectives; was too difficult to understand; and was too broadly defined. (See Table 8 for mean and median score ratings of problems encountered with the funds statement as required by ASRB 1007.)

Overall, these findings extend those of a number of investigators (see, for example, Dearden and Shank, 1975; Heath, 1978; McKinnon et al., 1983; Lee, 1983) who have highlighted various problems associated with the funds statement. Thus, the present findings suggest that any efforts (see, for example, Nurnberg, 1983; Ketz and Largay, 1987) to improve or refine funds statement reporting

Table 6
Means, Standard Deviations^a and Post Hoc Wilcoxon Matched Pairs Signed-Ranks Test Statistics^b for Ratings of Principal Users of Cash Flow Statements

	<i>Bankers</i> ($\bar{x}$ = 1.85, SD = 1.18)	<i>Managers</i> ($\bar{x}$ = 2.09, SD = 1.18)	<i>Institutional investors</i> ($\bar{x}$ = 2.30, SD = 1.15)	<i>Shareholders</i> ($\bar{x}$ = 2.55, SD = 1.10)	<i>Employees</i> ($\bar{x}$ = 3.31, SD = 1.08)	<i>Suppliers</i> ($\bar{x}$ = 3.46, SD = 0.95)	<i>Consumers</i> ($\bar{x}$ = 3.79, SD = 0.88)
Bankers ($\bar{x}$ = 3.26, SD = 1.25)		-3.16**	-5.71***	-7.78***	-11.10***	-10.69***	-11.53***
Managers ($\bar{x}$ = 3.36, SD = 0.98)			-2.02*	-4.81***	-10.41***	-9.61***	-10.90***
Institutional investors ($\bar{x}$ = 3.39, SD = 1.19)				-3.93***	-9.78***	-8.95***	-10.61***
Shareholders ($\bar{x}$ = 3.40, SD = 1.12)					8.10***	-7.68***	-10.17***
Employees ($\bar{x}$ = 3.84, SD = 0.75)						-1.99*	-5.11***
Suppliers ($\bar{x}$ = 3.88, SD = 0.89)							-6.41***
Consumers ($\bar{x}$ = 3.96, SD = 0.81)							

Note. ^aStandard deviations in parentheses. Mean scores and standard deviations rather than median and range in scores are presented to highlight differences that would have otherwise been observed by the median statistic. ^bt-test results were in line with those obtained from the non-parametric Wilcoxon procedures. Lower mean scores indicate greatest users of statements (i.e., 1 = strongly agree; 5 = strongly disagree). *p < 0.05, **p < 0.01, ***p < 0.0001. Post hoc matched pairs t-test statistics were in line with Wilcoxon test statistics.

Table 7
Means, Standard Deviations^a and Post Hoc Wilcoxon Matched Pairs Signed-Ranks Test Statistics^b for Ratings of Principal Users of Funds Statements

	<i>Bankers</i> ($\bar{x}$ = 1.85, SD = 1.18)	<i>Managers</i> ($\bar{x}$ = 2.09, SD = 1.18)	<i>Institutional investors</i> ($\bar{x}$ = 2.30, SD = 1.15)	<i>Shareholders</i> ($\bar{x}$ = 2.55, SD = 1.10)	<i>Employees</i> ($\bar{x}$ = 3.31, SD = 1.08)	<i>Suppliers</i> ($\bar{x}$ = 3.46, SD = 0.95)	<i>Consumers</i> ($\bar{x}$ = 3.79, SD = 0.88)
Bankers ($\bar{x}$ = 3.26, SD = 1.25)	—						
Managers ($\bar{x}$ = 3.36, SD = 0.98)	-1.56	—					
Institutional investors ($\bar{x}$ = 3.39, SD = 1.19)	-2.82**	-0.30	—				
Shareholders ($\bar{x}$ = 3.40, SD = 1.12)	-2.01*	-0.48	-0.14	—			
Employees ($\bar{x}$ = 3.84, SD = 0.75)	-6.56***	-6.54***	-5.24***	-5.82***	—		
Suppliers ($\bar{x}$ = 3.88, SD = 0.89)	-6.87***	-6.36***	-5.61***	-6.16***	-0.45	—	
Consumers ($\bar{x}$ = 3.96, SD = 0.81)	-7.32***	-7.20***	-6.42***	-7.03***	-2.49*	2.46*	—

Note. ^aStandard deviations in parentheses. Mean scores and standard deviations rather than median and range in scores are presented to highlight differences that would have otherwise been obscured by the median statistic. ^bt-test results were in line with those obtained from the non-parametric Wilcoxon procedures. Lower mean scores indicate greatest users of statements (i.e., 1 = strongly agree; 5 = strongly disagree). *p < 0.05, **p < 0.01, ***p < 0.0001. Post hoc matched pairs t-test statistics were in line with Wilcoxon test statistics.

Table 8
Mean and Median Scores, Standard Deviations^a and Range in Scores on Ratings of Problems Encountered with the Funds Flow Statement as Required by AASB 1007/AAS 12

<i>Problem</i>	<i>Mean score (n = 207)</i>	<i>Median scores (n = 207)</i>	<i>Range in scores</i>
Does not display critical information for decision-making	2.14 (0.86)	2	1-4
Funds statement lacks any ultimate focus	2.23 (0.94)	2	1-5
Not relevant to wide enough range of users	2.28 (0.84)	2	1-4
The concept of funds is too broadly defined	2.42 (0.80)	2	1-4
Weaknesses in the format of funds statement	2.46 (0.85)	2	1-4
Problems with terminology used	2.56 (0.82)	2	1-4
The funds statement tries to achieve too many objectives	2.66 (0.78)	3	1-5
The funds statement is too difficult to understand	2.69 (1.07)	2	1-5

Note. ^aStandard deviations in parentheses. Lower mean and median scores indicate higher ratings of agreement (i.e., 1 = strongly agree; 5 = strongly disagree).

could be a waste of research resources. Moreover, these findings indicate conclusively that the demise of the funds statement in Australian corporate financial reporting is both substantive and permanent.

Operating Cash Flow Versus Operating Profit

As mentioned previously, a number of investigators have advocated the use of CFSs because of limitations inherent in the accrual accounting system, especially in relation to the traditional performance measure of operating profit. Lee (1978 and 1993) recommended that cash flow reporting should replace traditional accrual-based accounting. In contrast to Lee (1981a) and McEnroe (1989), in the present study, respondents were not asked to consider cash flow reporting as a complete replacement to conventional accrual-based accounting. Respondents were merely requested to consider the relative merits of operating cash flow versus operating profit. The purpose of the questions was to provide yet another dimension by which support for the CFS could be ascertained.

A broad-based question was asked of respondents whether they considered operating cash flow to be a superior measure of a company's economic condition and future prospects than operating profit (as reported in conventional profit and loss accounts). Forty-eight percent of respondents either agreed or strongly agreed that operating cash flow was the more relevant measure, whereas only 28% of respondents rated operating profit as the more relevant measure. The chi square value was statistically significant [χ^2 (1, N = 160) = 10.00, $p = 0.002$]. Statistical testing of responses to another broad-based question on whether accrual-based earnings figures presented in conventional profit and loss accounts were a better predictor of future cash flows than historical cash flows was non-significant: only 31% agreed or strongly

agreed compared with 35% of respondents who disagreed or strongly disagreed with the statement.

Other statistically non-significant comparisons involved questions relating to whether operating profit was (a) a superior measure of performance than operating cash flow; (b) a more relevant measure than operating cash flow for assessing managerial performance; (c) a more relevant measure than operating cash flow for assessing overall company performance; and (d) a more reliable measure than operating cash flow for assessing operating performance.

In contrast, there was only one item where operating profit was rated as a superior measure to operating cash flow. That is, operating cash flow was not seen as a superior performance measure than operating profit because it reduces the problems associated with earnings variability [χ^2 (1, N = 117) = 10.5, $p = 0.0012$]. Table 9 shows mean and median scores, and standard deviations and range in scores on ratings of agreement with statements relating to the relative merits of operating profit versus operating cash flow.

These findings are contrary to traditionally held views that operating profit is a superior measure of business performance to operating cash flow. It is noteworthy that these findings differ from those of McEnroe (1989) who reported that most respondents agreed that historical cost income figures are a better measure of the economic performance of a company than operating cash flow. In light of these findings, and considering that the rise of the CFS in Australia has been recent, it seems possible that operating cash flow could supersede accrual-based operating profit as the primary measure of business performance (see Lee, 1978 and 1993). Moreover, the present findings confirm a particularly strong consensus, at least within companies, for the relevance and utility of the CFS.

Table 9
Mean and Median Scores and Range in Scores on Ratings of Whether Operating Cash Flow was Viewed as a Superior Measure of Performance to Operating Profit

<i>Measures of performance</i>	<i>Mean score (n = 207)</i>	<i>Median score (n = 207)</i>	<i>Range in scores</i>
Operating cash flow is a superior measure of performance to operating profit because:			
It avoids estimates for accruals and estimates (allocations)	2.95 (1.12)	3	1-5
It is a more relevant measure than operating profit for assessing managerial performance	3.00 (0.81)	3	1-5
It is a more relevant measure than operating profit for assessing overall company performance	3.00 (1.20)	3	1-5
It is a more reliable measure than operating profit for assessing operating performance	3.01 (1.13)	3	1-5
It is a superior performance measure to operating profit because it reduces problems associated with earnings variability	3.21 (0.82)	3	1-5
It is a superior measure to operating profit because it avoids problems of changing price levels which distort reported earnings	3.12 (0.88)	3	1-5

Note. *Standard deviations in parentheses. Lower mean and median scores indicate higher ratings of importance (i.e., 1 = strongly agree; 5 = strongly disagree).

The present findings must be viewed in light of possible criticisms. One possible concern is the measure. While this instrument was pretested on a number of academics, particularly in terms of its content and face validity, it was tested neither for construct validity nor test-retest reliability. However, some of the findings of this study were consistent with those of other investigations (e.g., Lee, 1981a; McEnroe, 1989). These consistencies suggest that similar constructs were investigated. While the results of the present study indicate considerably greater support for CFSs, particularly for the direct method of reporting cash flows, than the results reported by Lee (1981a) and to some extent McEnroe (1989), there could be a number of reasons explaining these differences. First, this study was conducted in a period when the decision-making relevance of CFSs had received much wider publicity, particularly by accounting regulators such as the AARF, the Australian stock exchange and the Australian Securities Commission (Walker and Robinson, 1992). Furthermore, the significance of the CFS has been growing as a result of widening international research exposure during the 1990s (see Lee, 1993). A second issue relates to the first. This study was conducted in a period where environmental conditions were quite different from those observable during the 1980s. The worldwide recession, coupled with disillusionment by the business community following numerous corporate collapses, has led to a much stronger emphasis on the importance of the CFS (Lyons, 1991).

Another limitation of this study relates to the sample. The sample size ($n = 210$) and response (42%) rate was similar to that of Lee (1981a) at 39%, but considerably higher than that reported by McEnroe (1989) at 27.4%. For the present study, the sample size can be viewed as adequate given that few mailed surveys in the social sciences achieve a response rate greater than 50%. In anticipation of a middling response rate (i.e., approximately 50%), we drew an initial sample ($n = 500$) that was larger than needed (see de Vaus, 1991, p. 73). Furthermore, some of the problems associated with a low response rate were overcome by specific tests made for non-response error.

Concluding remarks

Judging by the sudden rise of the CFS in Australia in the past three years, and the commitment by the business community to the value of the CFS, it is likely to continue to grow in importance. Surprisingly, negligible research attention has been given to the topic of cash flow reporting in Australia over the past decade. The present findings not only corroborate previous research originating from the UK and the US on the relevance and utility of the CFS (see, for example, Lee, 1981a; McEnroe, 1989), but indicate overwhelming support, at least from within companies, for CFSs and the essential requirements of AASB 1026, including some of its more stringent provisions. In fact, many of the results are largely counter-intuitive.

In contrast to previous studies (e.g. Lee, 1981a), this study focused on preparers rather than users, and on respondents representing a variety of occupational backgrounds. It was initially expected that preparers would be more reluctant to support greater financial disclosures than users. Furthermore, the CFS has been shown to appeal, at least from the viewpoint of respondents, to a wide range of external and internal users. Notwithstanding that findings should be interpreted in the context of internal viewpoints and managerial perceptions, these findings suggest that the real value of the CFS for decision-making potentially resides in the document's flexibility and general purpose nature. As well, findings indicate that the funds statement (even when prepared on a purely cash basis of accounting) is deficient in its content, format and underlying reporting objectives.

Given that the survey results indicate unequivocal support for the CFS from representatives of Australian public companies, this field of research clearly justifies substantially more research attention than it currently attracts from Australian academics. Many aspects of the CFS clearly warrant further research attention. For example, given the very strong support for the relevance of CFSs for decision-making, research could focus on developing procedures and techniques for improving the format and content of AASB 1026 to enhance its decision usefulness. Other areas for exploration include the relevance of forecast cash flow data and how forecasts should be reported; reporting the cash flow implications of changing price levels; refining the definitions and classifications of operating, financing and investing activities; the relevance of alternate formats for decision-making; and improving the presentation of specific forms of cash flow transactions, such as foreign currency transactions.

As well, considerably more empirical research is needed to investigate the decision contexts in which cash flow information is used by decision makers, and the actual and potential users of CFSs. Further research in this area will provide direction on where the content and format of AASB 1026 can be improved for decision-making. Furthermore, such research will provide valuable input into the development of theoretical models designed to test the relevance of the CFS for economic decision-making. The view held in this paper is that theoretical modelling of decision variables should not proceed without investigating how the CFS is actually used in practice by users. Owing to the general purpose character of CFSs for decision-making, it is suggested that theoretical modelling, and the subsequent testing of models, should embrace a broader range of decision variables in order to realistically capture and test the decision-usefulness capabilities of the CFS.

Finally, given that the present findings indicate surprising support, given previous research findings, for the importance of operating cash flow as a business performance measure, the relative merits of the CFS versus the accrual accounting system, in particular performance measures based on reported earnings, justifies further investigation. It is hoped that the findings of this study will afford a sufficient basis for precipitating greater research attention by academics in the topic of cash flow reporting. While the introduction of the CFS is clearly an important and dynamic development in company financial reporting, its potential still remains largely unexplored.

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Book Reviews

Ethical Reasoning in Accounting and Auditing. Lawrence A. Poneman and David R. L. Gabhart. CGA-Canada Research Foundation, Research Monograph 21, 1993. xvi + 148 pp. \$14.

In autumn 1994, revelations about British politicians, at least one of whom was a chartered accountant, brought the word 'sleaze' to the attention of the British public. The idea that politicians are guardians of the public interest and free from financial impropriety is an important myth in political life. Without this myth politics is merely a market like any other, an idea celebrated by Chicago economists and others concerned to debunk hallowed public institutions.

In a similar fashion, preoccupations with ethics in accounting and auditing are as long as the history of the profession itself. Without claims to follow ethical codes and serve the public interest, professionalism is yet one more increasingly fragile myth. No wonder that professional institutes have invested considerable resources in codifying and monitoring the ethics of their members. Agency theorists may be happy to strip auditor behaviour down to basic self-interest but this provides a radical challenge to the identity of a profession caught between a new business orientation and an older service ethic. So it is no surprise that the 'ethical behaviour' of accountants has become a matter for empirical research, if for no other reason than to rebut accusations of sleaze.

This monograph by Lawrence Poneman and David Gabhart explores the influence of ethical reasoning on the domain-specific judgment and behaviour of accountants. It reports the results of three empirical studies of US and Canadian public accountants which draws upon cognitive developmental theory. Cross-sectional and experimental studies of auditors from the US and Canada were conducted in order to test for cross-national differences in ethical reasoning. The research also attempts to determine the influence of ethical reasoning on auditors' cognitive judgments, for example about audit risk.

This approach depends on the credibility of Kohlberg's development schema, in which different stages of ethical development can be identified, moving 'up' from self interest towards a capacity for abstract universalism. His ideas have been operationalised for experimental purposes using the Defining Issues Test (DIT) to measure levels of ethical development.

The first study suggests that differences exist between Canadian and American accounting professionals in terms of the ethical reasoning level of the individual practitioner. Canadian CAs emerged as 'higher' and less homogenous, suggesting that 'ethical socialisation' is less developed in Canada. The second study reports CA and CPA perceptions of under-reporting billable time, shirking and premature 'sign off'. Accountants with high DIT scores tended to see this as a negative thing.

The third study concluded that auditors with high DIT scores were more effective in framing the competence and integrity characteristics of clients and management. The idea is that the more ethical you are ('higher' in terms of Kohlberg's developmental scheme) the greater the technical efficacy of the audit. Overall, Poneman and Gabhart want to demonstrate the importance of the ethical basis of practitioner choices. They argue that ethics is an essential and not a peripheral dimension of auditor task performance. The practitioner operates within an environment rich in ethical, as well as technical, cues which give rise to diverse pressures and conflicts. The issue is one of 'sensitivity to contextual audit evidence' and to unethical behaviour in the audit setting.

What are we to make of such a study as this? From one point of view it could be said that it is part of the 'market for excuses' for professional bodies subject to external scrutiny. Perhaps we should stop pretending that accountants are or can be ethical in any sense. What is required are effective incentive structures, such as liability, to ensure appropriate behaviours. This is the agency-theoretic viewpoint. However, the authors are correct to argue that questions of ethical propriety or otherwise are empirical issues. It therefore follows that credible empirical methods are needed to investigate the phenomenon—especially as there is considerable anecdotal evidence about the economic pressures on auditors to cut corners in their work.

Furthermore, this study is hardly an excuse for the profession as a whole, although Canadian professionals tend to come out well from it, since it makes some critical observations. The results suggest that ethical reasoning of accountants and auditors is lower than for college educated adults. In addition, partners in US firms tend to think at the 'conventional level' of ethical development in which they affiliate with the interests of their peer group, whereas partners in Canadian firms tend

to be more sensitive to conflict at higher levels of ethical reasoning.

It may also be wrong to be too cynical about professional ethics; sustaining a certain kind of official normative language may be hypocritical but it preserves the concept of public interest as a basis for external criticism of the activities of accountants. And there may be an interesting educational issue; if accountants are trained as compliance robots in technical matters it can hardly be a surprise if ethical standards are low. However, the limited focus of this study, and others like it, is also evident: codes of ethics for individual practitioners, however they may be written in terms of the public interest and however behaviour may be measured, leave intact the primary loyalty to the paying client. In the end it may be that the conflict for the individual can only arise in the following form: 'Can I really go on doing this or should I quit?'

London School of Economics Michael Power

European Financial Reporting Series. France. *J.-C. Scheid and P. Walton.* xvi + 357 pp. 1992. **The Netherlands.** *J. Dijksma and M. Hoogendoorn.* xv + 255 pp. 1993. **Germany.** *D. Ordelheide and D. Pfaff.* xxi + 314 pp. 1994. **Luxembourg.** *P. Clark.* xv + 345 pp. 1994. **United Kingdom.** *P. D. Gordon and S. J. Gray.* xv + 261 pp. 1994. Routledge in association with the Institute of Chartered Accountants in England and Wales. £65 each.

These five volumes form part of a series of 12 books (covering the European Union as it was before 1 January 1995) edited by Stuart McLeay and Simon Archer. The books on Ireland and Spain have already been reviewed in this journal. The 12 books represent the successors to the pioneering series of six books on Germany, France, the Netherlands, Italy, Spain and Sweden, published by the ICAEW in the 1970s and 1980s, which for the first time made details of continental European financial reporting readily available to an English speaking audience. The general pattern of each of the new books is much the same although the detail varies: an opening section of four or five chapters on the business environment followed by a longer section on accounting, auditing and financial reporting, and rounded off by appendices which include illustrative financial statements (mainly in English but with some pages in the original language where different), a comparison with one of more of US GAAP, UK GAAP and international accounting standards, and information on how EC directives have been translated into national legislation. Each book also contains a bibliography and, except in the case of the UK volume, a glossary.

Sensibly, the books are not completely uniform. The French volume, for example, has a chapter on the *conseil national de la comptabilité* and the *plan comptable général*; the German volume a chapter on co-determination and the labour market; the Luxembourg volume chapters on investment funds, holding companies and insurance companies; and the UK volume a chapter covering, *inter alia*, off-balance sheet finance and environmental accounting.

Teachers and researchers of international accounting will find these books extremely useful. They are written by leading authorities and are very thorough and comprehensive. Both the authors and the editors are to be congratulated on the tremendous amount of work they have obviously put into this project. English-speaking accountants will have no excuses for not obtaining (if they need it) an in-depth knowledge of financial reporting in the countries covered.

Writers on international accounting have to face more than most the difficulties of getting their facts right and keeping them up-to-date. I have not been able to discover any factual slip-ups in these volumes. (Like any other reviewer I cannot claim a detailed knowledge of accounting in all the countries covered.) Inevitably, the books are already starting to date a little.

I have only two grumbles. Not all the indexes are as helpful as they could have been and, given that the tables of contents are equally laconic, the reader is sometimes reduced to flicking through the pages in search of information which could have been made more accessible. Secondly, the prices are high even for library purchase. Fortunately there is a paperback students' edition of the UK volume priced at £16.99 and the 12 volume set can be purchased for £420.

University of Exeter

R. H. Parker

Capital Markets-Based Research in Accounting: An Introduction (Coopers & Lybrand Accounting Research Methodology Monograph No. 1). *Philip Brown.* Coopers & Lybrand (Australia) and Accounting Association of Australia and New Zealand, 1994. 182 pp. + vii. A\$60 (A\$40 for the book + A\$20 postage outside Australasia).

This monograph is the first in a series funded by the Coopers & Lybrand Accounting Education and Research Fund and the Accounting Association of Australia and New Zealand to enable professors eminent in the field of accounting and finance research to visit universities and then to write a monograph from their lectures. The overall objective of the programme is to encourage and promote both research and the knowledge of research methods amongst faculty and research students in Australia and New Zealand.

The objective of this first monograph is to introduce key strands of the literature dealing with the association between earnings and stock prices. It is not an exhaustive review of market-based accounting research in the style of Lev and Ohlson (1982). For the key papers selected, approximately one page is spent outlining the essentials of the empirical tests undertaken and how they advance previous work. As one of the founding fathers of the research area, it is not surprising at all that Philip Brown gives a masterly and lucid exposition of the papers he selects and also of the research area as a whole. The book is divided into three parts: Part I Origins; Part II Extensions; and Part III Applications.

Part I initially deals with the intellectual roots of the area: the rationale for studying market associations with earnings numbers; the EMH and the underlying theory of equilibrium capital asset pricing (such as CAPM and APT) which are maintained hypotheses in event studies; and the Miller Modigliani (1961) paper which specifies the value of a company as being driven by the sustainable earnings from the assets in place and the excess profits from future assets. After a review of the early studies such as Ball and Brown (1968), Beaver (1968), Fama, Fisher, Jensen and Roll (1969), the review moves on to more recent work on the determinants of the earnings response coefficient in papers such as Easton and Zmijewski (1989). There is also a succinct presentation of the proposal, in Easton and Harris (1991), that the abnormal returns model should include an earnings level variable in addition to the more common earnings change variable.

Part II is concerned predominantly with modelling market earnings expectations; for example, time series prediction models are compared with analysts' forecasts. This arises initially out of a concern with the experimental design of events studies, but soon treats the issue as important in its own right because it gives us some evidence about how the market processes and interprets earnings numbers. This leads naturally to some discussion of the role of analysts in the impounding process and the various market efficiency anomalies such as Ou and Penman (1989), Holthausen and Larker (1992), Bernard and Thomas (1989 and 1990). Finally, the impounding process is analysed by considering that prices can be informative about earnings as suggested in Beaver, Lambert and Morse (1980). This contrasts with the more common specification in which earnings innovations contain implications for prices.

Part III reviews financial reporting policy issues that have been investigated using event study techniques. They include: price level accounting (Beaver, Griffin and Landsman, 1982); cash flow accounting (Bowen, Burgstahler and

Daley, 1987); and international comparative financial accounting.

The monograph is an elegant introduction to the key papers in the returns-earnings literature. It is well suited for advanced third year undergraduate and postgraduate courses. The exposition is lucid and self-contained. However, the monograph does very little to achieve one of its objectives, which is to encourage and stimulate research in the area. There is very little in the monograph that indicates the direction in which Brown thinks future research should move. Given that Brown (with Ball) wrote one of the most influential papers in the past 30 years, this is rather disappointing. Two examples of these omissions follow.

First, one of the theoretical underpinnings of the returns-earnings literature is the Miller Modigliani investment opportunities approach to valuation; this is that valuation is driven by the sustainable cash flow from the assets in place together with the excess profits from future investment. This is used to explain why earnings innovations may contain value relevant information because they may revise estimates of sustainable cash flow from existing operations. The MM model is also used to explain why prices might contain information that is absent from current earnings because the prudence principle restricts the extent to which earnings information can anticipate the outcome of future investments.

Whilst I think that the MM view of the world is a useful way to think about the role of accounting information (see Darnell and Skerratt, 1989), it does assume that the concept of sustainable cash flow from existing assets has a real world counterpart (presumably the earnings number). This is seriously questioned in the work of Ray Chambers; therefore, the valuation model offered by James Ohlson, which maps value to the book value of assets and the excess returns on book value, may be more appealing. However, Brown's monograph makes little or no attempt to compare the MM approach with Ohlson's. What does Brown think that the Ohlson framework has to offer over and above the investment opportunities approach of MM; how might the relative merits of the two models be tested?

Second, on the lagged impounding anomalies, he believes that the evidence for the earnings post announcement drift (Bernard and Thomas, 1989) is stronger than that for the lagged impounding of balance sheet information (Ou and Penman, 1989). He also makes the useful point that, eventually, a given anomaly must disappear, either by discrediting the evidence, including it in the theory of market equilibrium, or by it being arbitrated away. However, there is very little indication as to what issues might be worth investigating in trying to improve our understanding of the evidence to date.

For example, given the mixed findings in replicating the Ou-Penman experiment, would it be worthwhile to investigate whether lagged impounding of balance sheet information is located in particular economic circumstances, such as large changes in earnings, or in specific industries?

One of the more obvious questions that also needs further investigation is the time dependence of results (see, for example, Holthausen and Larker, 1992). Even if, in a given period, a particular component of the balance sheet is found (ex post) to have information content about future earnings, the market might be expected to pick this up only if the effect is systematic over time. A related point is that there may also be financial reporting implications of the findings; if information is not costless for market agents to process and if information is not being impounded, then the explanation may lie in the structure of the financial reports available to investors. The UK standard FRS 3 seems to have taken such a possibility to heart by requiring companies to provide a statement of total recognised gains and losses; this gives information about gains and losses that previously would have been buried in the notes to the balance sheet.

Another strand to the more recent literature, of clear relevance to the Ou and Penman debate, is to take more seriously the insights of Grossman and Stiglitz (1980) concerning the incentives investors may have to acquire information. For example, papers by Brennan (1990) and Bikhchandani, Hirshleifer and Welch (1992) suggest that individuals may have incentives to ignore their private information and to follow the actions of others. But the nearest Brown gets to this is a section on the role of analysts; and even here, he does not give much idea of whether analyst research will contribute to our understanding of the informational needs of investors.

However, these perceived shortcomings may be the result of an upward bias in my expectations. What is clear is that the monograph is an elegant, masterly and self-contained presentation of the earnings-stock price literature. It is a pity that, at A\$60, it is unlikely to have many purchasers amongst graduate students outside of Australasia.

University of Manchester

Len Skerratt

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Management Accounting Pathways to Progress.
M. Bromwich and A. Bhimani. CIMA, 1994.
x + 281 pp. £12.95.

This book is an extensively revised successor to the high profile CIMA publication *Management Accounting: Evolution not Revolution* (1989), by the same authors. All of the chapters have been rewritten with a considerable expansion of material on overseas developments and on specific topical areas. The revision also updates the previous contents and enhances the authors' review of the technical content. The result is a substantial text which should prove even more successful than its predecessor.

It aims to 'give a fairly detailed exposition of a relatively comprehensive range of recently

suggested accounting techniques in an accessible fashion'. In addition, there is an assessment of each technique's potential as a 'pathway to progress'. The book thus has a prominent current issue orientation but one imbued with a careful and insightful review accompanying each of the technical descriptions provided. The content is presented in a clear and straightforward manner which will ensure its ready accessibility not only to academics but also to practitioners and students. In education, the absence of traditional management accounting and few illustrative examples will probably require it to be used as a supplement to an established text or as a basis for a current issue course.

Almost 400 references, predominantly from the literature of the last decade, attest to the achievement of the authors' objective of providing a contemporary work reflecting recent proposals for the development of management accounting practice. This material is structured into chapters on automated technologies and management innovations, emerging cost management practices, fixed overhead costing, strategic management accounting, the Japanese, North American and UK positions (separate chapters) and a futuristic assessment of management accounting. The latter commentary emphasises the need to view techniques within national cultures, organisational structures, technological context and the informal system existing in the organisation before the appropriateness of any technique can be assessed and its success safeguarded. The complexity of management accounting system design and change is thereby highlighted through a socio-technical conception of the discipline.

Wisely from this perspective, the authors are cautious in their endorsement of the need for or nature of change in management accounting. Indeed, one of the fundamental issues that is raised by this type of technique-oriented review is the question of how to go about assessing the value of and success of new management accounting techniques. With the considerable number of innovations currently possible, the process by which change occurs in management accounting and the means by which innovations might be assessed ex-post are respectively readily accessible for research and in demand as research topics.

The text has as its core a wide-ranging coverage of new management accounting techniques including activity-based costing, life-cycle costing, throughput accounting, value analysis techniques, strategic cost analysis, tableau de bord, quality costing and many others. Indeed, one of the shortcomings of the text from the user perspective is the absence of an index to facilitate access to what has now become a substantial text. Few important omissions spring to mind, although there is little mention of the topical balanced scorecard ap-

proach to performance measurement or of business process re-engineering. Internationally the text is, understandably, somewhat constrained by available western literature. Thus the extensive indigenous Japanese literature on management accounting is not used and comment on management accounting in the fastest growing Pacific rim economies is absent.

The authors' assessments of the techniques selected are particularly valuable, frequently highlighting the shortcomings of accounting practice when screened against the normative rigour of an economic perspective. Few practical accounting techniques do well in this type of evaluation. Thus, for example, the full utilisation of costs using an ABC methodology is criticised. The authors state that costs should be reported only 'at the level in the organisation at which they become incremental'. This implies a very direct decision-making role for full unit cost information in determining the incremental cost effects of decisions. It is generally accepted that this would be inappropriate.

However, it may be that full unit costs can play a role in decision making which ABC can enhance. For example, they may provide the basis of a signalling system directing management's attention to particular products and *initiating* rather than providing a basis for product-orientated decisions. Flagging a potential alteration to the rate of consumption of shared resources may bring to management's attention possibilities for contingent alterations in the organisation's future cash flows. The inclusion of a share of common costs at the level of the product may also fulfil a beneficial motivational role in influencing product managers' economical use of shared resources. The wider cost management applications of activity-based costing have also become increasingly evident and now appear to represent as strong a reason for its adoption as unit cost refinement. These applications need not involve unitisation.

The text stimulates thought and, all in all, is an excellent profile of the current state of the art in management accounting. It represents a valuable checklist for practitioners, a comprehensive current issues supplement for students and a convenient briefing document and source of research ideas for academics. It is rightly destined for the best seller category.

University of Edinburgh

F. Mitchell

Management Accounting: A Spreadsheet Approach.
Neil Marriott and Roy Chandler. Prentice Hall,
1993. xiii + 311 pp. £17.95.

The aim of this book, a companion to *Financial Accounting: A Spreadsheet Approach* by Marriott and Simon, is to illustrate a spreadsheet modelling

approach to management accounting. It is intended for use in specialist accounting degree or similar schemes which, in the authors' words, 'increasingly call for integration of computer skills'. It will particularly appeal to those who condemn the practice of teaching computers and information systems in a separate specialised course. It will appeal less to those who believe learning new accounting concepts is enough of a challenge without, at the same time, struggling with computers. The latter camp will find ammunition enough in the first four chapters, one of which gives an introduction to the role and functions of management accounting while the other three cover microcomputer basics, spreadsheet basics and model-building. These foundations are, however, essential to a book of this type. Here they have the merit of being clear, concise and informative and the book instils good modelling practice right from the start.

A further 10 chapters cover the range of topics to be found in most management accounting texts, including costing, budgetary control, decision-making and investment appraisal. Each chapter provides a brief introduction to the topic and worked examples extending the student's spreadsheet skills a little further. The authors have chosen to base examples on Lotus 1-2-3 but argue that all necessary calculations, formulae and models are presented in a way that can be readily adapted to any spreadsheet package. Although the features of most spreadsheets are similar, variations are bound to detract from the learning experience if a novice uses a different package.

The text works through spreadsheet solutions step by step, including specified cell references, so that each student will complete a near-identical model. This increases the prospects of a successful model and makes teaching of initial examples more manageable. Each chapter offers further exercises in which students can be more individually creative. The authors decided not to provide students with a disk of ready-made models on the ground that they would gain much more from constructing the models themselves. A disk is, however, available to instructors. 'What if?' questions invite students to explore the models they have constructed. This should encourage a habit of analytical inquiry and reinforce understanding of the management accounting techniques.

The book's approach will be welcomed by those who consider lectures a poor way to promote learning and who appreciate the greater motivation and sense of achievement that students gain from good computer workshops. Two potential problems need to be considered, however. Firstly, the book provides little more than a basic introduction to each of the management accounting topics. It may therefore have to be used with another more comprehensive text on courses for accounting

students. Secondly, even if students are expected to do much of the work on their own, the book's dependence on spreadsheets will place heavy demands on resources.

The authors have achieved a highly readable text on which to base an interesting and effective course. Staff and students who have been casual users of spreadsheets for some years, but who would not claim to be experts, may extend their repertoire of useful spreadsheet features. They will also find a wealth of practical management accounting applications. Those who have wrestled with software manuals, and lost, will find themselves reaching for this text as a handy, user-friendly reference.

University of Stirling

Ken Pratt

Hospitality Management Accounting. *M. M. Coltman.* Van Nostrand Reinhold, fifth edition, 1993. viii + 536 pp. £17.95.

The author has a fairly general target audience in mind for this book, namely students 'taking courses that are accounting orientated and related to the hospitality industry'. He stresses that the book is intended to be introductory in nature, rather than exhaustive. This is a US textbook where the first four chapters are concerned with a background to financial accounting, covering a review of accounting, understanding financial statements, and two chapters on the interpretation of accounts including ratio analysis. While the material is covered at a fairly basic level, the author does at least make some attempt to remind readers of some of the limitations of financial statements.

Chapter 5 is devoted to the basics of internal control, while Chapters 6 to 12 cover limited aspects of management accounting. It is in these areas that the book begins to look poorly structured. First, there is no clear discussion of the role of head office versus the role of the individual hotel in the management accounting process; this is surprising given that, for the most part, many students in the hospitality industry will end up working for groups of hotels rather than individual hotels. Second, it would be more coherent to see a clear discussion of the planning, decision making and control aspects of management accounting. Rather perversely, the discussion of financial goals and information systems is left until Chapter 14 while Chapter 13, on feasibility studies, follows the chapter on investment appraisal! Third, there is no discussion of the implications of franchising and management contracts, both of which are important features of the industry.

For the most part, the chapters on management accounting take 'standard textbook' approaches and over-lay them with specific features of the

hotel and catering industry. There are a number of inadequacies that show through. The chapter on pricing perhaps over-emphasises the role of cost data, whereas the UK empirical evidence suggests that competitors' prices are the key factor driving pricing strategy. The chapter on investment appraisal provides an assessment of the 'lease versus buy' decision at odds with the Myers, Dill and Bautista method.

In all, although this text covers many of the areas that would be useful in the industry, it has a number of important shortcomings which make it difficult to recommend as a main course text.

University of Exeter

Alan Gregory

Readings and Notes on Financial Accounting: Issues and Controversies. Stephen A. Zeff and Bala G. Dharan. McGraw-Hill, fourth edition, 1994. xvii + 782 pp. £25.95.

This book of readings, edited by two US academics, is the successor to *Financial Accounting Theory: Issues and Controversies* by Stephen Zeff and Thomas Keller, the third edition of which was published in 1985.

The editors draw attention to the expanding volume and complexity of official pronouncements that students in the US have to master and the effect of this on the content of financial accounting courses. If students are to become more than mere technicians, it is essential that they are exposed to readings and, like the previous edition, this volume is designed to supplement an intermediate accounting course or an accounting theory seminar. While UK accountants are not yet as overloaded with official pronouncements as their US counterparts, there is no doubt that both the number and complexity of UK standards are growing and few academics who teach financial accounting here will have failed to wrestle with a tendency towards ever-growing syllabi with greater technical content.

This fourth edition now contains 83 readings, only 10 of which appeared in the previous edition. While many of the readings are drawn from academic journals, others come from such sources as general interest magazines, bulletins of professional firms, lectures and even private correspondence. Thus, while it includes old favourites like Zeff's own article on 'The rise of "economic consequences"' and Thomas's neat article on 'The FASB and the Allocation Fallacy', it also includes articles from the *Economist*, *Forbes* and the *New York Times* as well as a letter from the chairman of the Financial Accounting Standards Board to

the Securities and Exchange Commission. The inclusion of such relatively inaccessible material undoubtedly helps teachers to bring the subject to life.

The readings are divided into 18 chapters, commencing with the Development of Accounting Standards and Objectives of Accounting respectively. The third chapter, entitled 'Financial Statements', gathers together a number of readings on the expanding annual report, including coverage of cash flow statements, the Management's Discussion and Analysis section of the annual report and the possibility of introducing a Value Added Statement in the US. The book then moves on to the familiar headings of chapters found in US intermediate accounting texts. These include Revenue Recognition, Integrating Uncertainty into Accounting: Receivables and Contingencies, Inventory, Plant Assets and Depreciation, Goodwill and Other Intangible Assets, Intercompany Investments, Long-term Liabilities, Leases, Pensions and Post-retirement Benefits, Income Taxes, Shareholders' Equity, Earnings Per Share and Accounting Changes. The book ends with chapters on Changing Prices and International Financial Reporting Issues.

Each of the chapters has an extremely good introduction by the editors which is designed to place the readings in context by explaining the background to each topic and discussing the issues involved. These introductions also include excellent bibliographical notes which describe publications not just from the US but from Australia, Britain, Canada and New Zealand. While the preface refers to the inclusion of works by continental European authors, these seem to be relatively thin on the ground!

There is undoubtedly much first class material here but the use of a US book of readings on British financial accounting courses always raises certain problems. First, the book excludes several topics that would usually be included in an intermediate accounting course in the UK; examples are the treatment of acquisitions and mergers and accounting for associates and joint ventures. More importantly, the regulatory frameworks in the two countries are very different so that, even where US and UK accounting standards have covered the same subject, there are differences, sometimes subtle, which are often difficult for a student to appreciate. Readings based on the US position may cause confusion and must therefore be used with care.

University of Buckingham

David Pendrill

Accounting and Business Research

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David Solomons and British Accounting

David Solomons (1912–1995)—An Appreciation

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Contents

The Incidence of Accounting-based Covenants in UK Public Debt Contracts: An Empirical Analysis	David B. Citron	139
Segmental Reporting: A Preparers' Perspective	Pamela Edwards	151
The Boulton & Watt Case: The Crux of Alternative Approaches to Accounting History?	Richard K. Fleischman Keith W. Hoskin Richard H. Macve	162
Audit Judgments of Revalued Non-current Assets: The Effect of Conflicting Risks	Jenny Goodwin Ken T. Trotman	177
Post Investment Demand for Accounting Information by Venture Capitalists	Falconer Mitchell Gavin C. Reid Nicholas G. Terry	186
An Investigation of Framing and Firm Size on the Auditor's Going Concern Decision	Priscilla O'Clock Kevin Devine	197
An Empirical Evaluation of an Induced Theory of Financial Ratios	Mark Tippet Geoffrey Whittington	208
Book Reviews:		
J. Flower, <i>The Regulation of Financial Reporting in the Nordic Countries</i>	T. E. Cooke	219
David York, <i>Audit Reports: A Practical Guide to Preparation Under SAS 600</i>	E. N. M. Okike	220
G. Carnegie, J. Cravens, R. Gibson, <i>Cases in Financial Accounting</i>	Stuart Turley	221
Occasional Reviewers		223

Forthcoming Articles

Vivien Beattie and Stella Fearnley, The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies

Sean M. Hennessey, Earnings Forecast Revisions and Security Returns: Canadian Evidence

Don Herrman and Wayne Thomas, Harmonisation of Accounting Measurement Practices in the European Community

Stewart Jones and Kerry Love, Recent Evidence on Australian Current Value Accounting Practices: Is the Phoenix Rising from the Ashes?

Rifaat Ahmed Abdel Karim, The Nature and Rationale of a Conceptual Framework for Financial Reporting by Islamic Banks

Lynn L. Rees, The Information Contained in Reconciliations to Earnings Based on US Accounting Principles by Non-US Companies

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The Incidence of Accounting-based Covenants in UK Public Debt Contracts: An Empirical Analysis

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Abstract—Accounting-based covenants are of particular interest to accounting researchers in view of their potential to influence management's accounting policy choices and their attitudes to new accounting standards. This exploratory paper provides evidence on the incidence of accounting-based covenants in 108 UK public debt contracts for the period 1987-1990. Thirty percent of the agreements contain such covenants, the majority of which are affirmative gearing covenants. Focusing on the institutional differences between the UK and the US, the paper examines relationships between the presence of accounting-based covenants and (a) characteristics of the issuing firm, and (b) other control mechanisms included in the debt agreement. UK firms raising public debt are of good credit quality and UK insolvency procedures afford unambiguous protection to secured creditors. As a result, accounting-based covenants are associated with long-term unsecured debt and with firms having high values for assets-in-place but, in contrast with US findings, are unrelated to gearing. Convertibility appears to reduce the need for accounting-based covenants, especially when the debt is also subordinated. The relationship between accounting-based covenants and security depends on the nature of the security (fixed or floating). Longer term non-convertible debt agreements are, therefore, particularly likely to contain covenants that could influence management's accounting behaviour. This paper provides a starting point for further research into these issues.

Introduction

Long-term debt agreements contain covenants placing restrictions on borrowers with a view to controlling the conflicts that can arise between debtholders and shareholders (Smith and Warner, 1979). Those covenants that are accounting-based are of particular interest to accounting researchers. This is because there is a large body of evidence that firms adopt income-increasing accounting policies in the years prior to breaching accounting-based covenants (Watts and Zimmerman, 1986, Ch. 11; Beneish and Press, 1993; DeFond and Jiambalvo, 1994). Furthermore, since accounting-based covenants are largely based on those generally accepted accounting principles (GAAP) in force at the time compliance is being monitored, it has been hypothesised that new income-decreasing accounting standards could bring about default. This hypothesis has been largely investigated by testing for a negative share price effect among firms most likely to be

adversely affected by a new standard. Research, on balance, finds no evidence for an adverse price impact (see, for example, Frost and Bernard, 1989; Gopalakrishnan and Sugrue, 1992), but this conclusion is not unanimous (Mohrman, 1993).

In view of the relevance of accounting-based covenants to accounting research, this paper examines the incidence of such covenants in a sample of UK public debt agreements. It extends previous work in this area in a number of ways. First, it looks at an institutional environment which differs from that in the US both in terms of the general quality of the firms accessing the public debt market and in terms of the two countries' contrasting insolvency procedures. Second, unlike other research into the structure of public debt agreements (Malitz, 1986; Begley, 1993), it includes convertible debt issues. Finally, the analysis of security explicitly distinguishes between fixed and floating charges.

The next two sections review previous research and highlight the key features of the UK environment for public debt instruments. The following two sections suggest hypotheses as to how firm characteristics (investment opportunity set and gearing) and other features of the debt agreement itself (security, term to maturity, convertibility and seniority) are likely to influence the incidence of accounting-based covenants. The subsequent sections describe the data and research design, report results and draw conclusions.

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Prior research

Previous research into the incidence of accounting-based covenants has focused on the US, Canadian and Australian markets. The small volume of UK research has looked only at private debt agreements. Basing itself on Smith and Warner's costly contracting hypothesis (1979), this body of research examines whether accounting-based covenants are associated with: (a) characteristics of the issuing firm (leverage, investment opportunity set); and (b) other features of the debt instrument itself (seniority, collateral, term).

There is general agreement on a positive association between the use of accounting-based covenants and leverage (for the US see Malitz, 1986; Duke and Hunt, 1990; Press and Weintrop, 1990; El-Gazzar and Pastena, 1991; Skinner, 1993; and for the UK, Citron, 1992; Day and Taylor, forthcoming). The relation with assets-in-place is inconclusive, however, with Begley (1993) finding a negative association, while Skinner (1993) shows a positive relationship. Studies into the related area of accounting-based executive compensation contracts also have mixed results. While Smith and Watts (1992) find a positive association between the use of such contracts and assets-in-place, Gaver and Gaver (1993) report no association.

As far as the inter-relations between the terms of the debt instrument are concerned, accounting-based covenants are found to be uncommon in both subordinated debt agreements (Begley, 1993) and when collateral is present (El-Gazzar and Pastena, 1991). The relationship with term to maturity is unclear, however, with El-Gazzar and Pastena finding a positive association, Begley a negative one and Francis (1989) showing mixed results.

This paper seeks to shed some light on the conflicting findings outlined above. It examines these issues in the context of the UK public debt market, the relevant features of which are set out in the next section.

The UK public debt market

There are a number of important institutional differences between the UK and the US that can help clarify our understanding of the use of accounting-based covenants in UK public debt instruments. These are:

1. The UK corporate public debt market is relatively small compared with that in the US (Blake, 1990)¹ and access to this market is generally

¹Of the total sources of funds of UK commercial and industrial firms during 1987-90 only 4.6% came from market issues of loan capital and preference stock (Central Statistical Office, 1992) while in the US bonds and mortgages provided 17.1% of corporate funds (US Department of Commerce, 1993). In the UK, 27.1% of funds came from bank borrowings compared with 10.6% from loans and short-term paper in the US.

obtained only by high quality firms (Rutterford, 1992; Thomson, 1988). Connected with this is the absence of sinking funds in the UK (Rutterford, 1992, p. 142), in contrast to the US where sinking funds are common in debt with maturity of 15 years or more (Francis, 1989).

2. The focus of US insolvency law is on debtor protection while in the UK it is on the preservation of value for the firm's creditors, particularly secured creditors. Thus in Chapter 11 proceedings in the US the debtor generally remains in control of the business, while in the UK a receiver is appointed by a secured creditor and his duty towards that creditor takes precedence over that to any unsecured creditors (Franks and Torous, 1993).
3. In the UK contractually agreed priorities of claims are strictly adhered to in liquidation, whereas in the US deviations from absolute priority are common: '... the majority of Chapter 11 reorganisations provide for deviations from absolute priority in favour of shareholders and, in some cases, junior or unsecured creditors' (Franks and Torous, 1993, p. 102; see also Franks and Torous, 1989).

Characteristics of the firm and accounting-based covenants

Investment Opportunity Set

According to Myers (1977), firm value is made up from assets that are already in place plus future discretionary investments (or growth options). Myers (1977) and Smith and Warner (1979) argue that the agency costs of debt are more severe for firms whose investment opportunity set consists more of growth opportunities than assets-in-place. It follows that there should be a greater demand for such firms to provide covenants. For example, an accounting-based covenant, such as a ratio of debt to tangible net worth, could limit these agency problems by requiring the firm to maintain adequate tangible asset levels.

On the other hand, recent North American research suggests a number of reasons why a low value for assets-in-place should be associated with a lesser use of accounting-based covenants:

1. Begley (1993) argues that supply-side considerations counteract the above demand-side influences. Thus firms with more growth opportunities will have a greater need for future debt finance to fund such investments. They will, therefore, be less prepared to provide gearing covenants that would restrict future financing options.
2. Related to the above point, Skinner (1993) argues that firms with less assets-in-place will currently only be able to support low levels of gearing and hence will have fewer covenants.

3. Recent theoretical work by Feltham and Ohlson (1993) and Ohlson (1993) views the excess of market value over book value in growth firms as a function of their goodwill, i.e. their ability to earn profits in excess of the risk-free rate of return. The performance of such firms, whose value is derived more from their ability to earn 'super-profits' (for example, due to monopoly power) rather than from their assets-in-place, is less easily captured by GAAP-based accounting measures. Hence these firms are less likely to include accounting-based covenants in their loan contracts (see also Smith and Watts, 1992, p. 276; Skinner, 1993, p. 412).
4. Related to point (3), a relatively low ratio of book value to market value may arise from the use of conservative accounting policies (Feltham and Ohlson, 1993). For example, the practice of writing off research and development expenditure is likely to result in the book value of such an investment falling below its economic value. If, however, firms that adopt conservative accounting practices instil greater confidence in lenders, there may be less demand for such firms to acquiesce to the control imposed by accounting-based covenants.²

The relatively high quality of firms accessing the UK public debt market suggests that, for such firms, the agency costs of debt will carry less weight than the above four factors in determining the use of accounting-based covenants.

Gearing

The agency costs of debt are greater the higher is gearing. This is because highly geared firms are more likely to become financially distressed and in such cases shareholders have stronger incentives to engage in activities such as underinvestment and dividend payouts that would transfer wealth from debtholders to themselves. Therefore, in line with previous research, we would expect highly geared firms to be more likely to provide accounting-based covenants that will limit such activities in advance by requiring them to maintain asset levels.³

Other features of the debt agreements and accounting-based covenants

Firms can incorporate a variety of mechanisms (such as security, seniority and term to maturity)

in their loan contracts to control shareholder/debtholder conflict. Smith and Warner (1979, p. 154) and Begley (1993) discuss the difficulties involved in analysing the interrelationships between accounting-based covenants and these other control mechanisms. The problem arises because all these features of the loan agreement are determined jointly as part of an all-inclusive 'package'. However, since the focus of this paper is on accounting-based covenants, it adopts the approach of treating these covenants as the dependent variable and other features of the loan contract as independent variables.

As a result the sign of the predicted relationship between accounting-based covenants and variables such as seniority or term to maturity is unclear. This is because it is not known whether these control mechanisms are likely to act as substitutes or as complements for one another. The following paragraphs try to elucidate these issues in the context of the institutional features of the UK public debt market.

Security

Where debt is secured, the scope for debtholder/shareholder conflict is reduced since the lender's claim over specific assets limits the likelihood of asset substitution and claim dilution (Smith and Warner, 1979, p. 127). It is also the function of accounting-based covenants, such as a gearing constraint, to limit the issuing of additional debt and asset substitution. We would expect that, when debt is secured, such covenants are redundant and are therefore less likely to be used.

Debt secured by a fixed charge does, however, require a timely trigger to ensure that the asset subject to the charge is still of value. In such cases, however, covenants are not expected to be accounting-based (i.e. ratios based primarily on numbers found in the financial statements) but to be more specifically related to the value of the secured assets themselves and the income that they alone generate.

However, this argument only applies where the debt is secured by a fixed rather than a floating charge.⁴ Two distinctions between fixed and floating charges are of interest here. First, because the floating charge permits the borrower to deal in the assets in question, it provides no protection against asset substitution. Second, as a general rule, a fixed charge creditor has priority over a floating charge

²I am grateful to a referee for the arguments developed in points (3) and (4).

³Thornton's (1992) study of the Canadian lease capitalisation standard shows that firms more vulnerable to potential changes in GAAP are less likely to include accounting-based covenants in their loan agreements. This paper assumes, therefore, that all firms in the sample are equally vulnerable to possible changes in GAAP during the terms of their debt instruments.

⁴A fixed charge provides the lender with security in the form of specific identifiable assets that cannot be disposed of by the borrower without the lender's permission. With a floating charge, however, the borrower can, within certain limits, deal in the assets under the charge unless an event of default occurs. If this happens the floating charge crystallises and becomes a fixed charge over the assets that are available at that time.

creditor.⁵ It follows that a lender's priority is less well protected by a floating charge than by a fixed charge.

Thus, for a floating charge to provide adequate security, the debtholder must be able to trigger an event of default early enough for the security to realise sufficient funds. Financial covenants provide notice of impending financial distress. We would expect, therefore, that accounting-based covenants will be found in debt secured by only a floating charge, since this security is of little value if there is no trigger to crystallise it.

Term to Maturity

The expected relation between the presence of covenants and term to maturity is ambivalent. Myers (1977) and Barnea et al. (1980) argue that the agency costs of debt are reduced by shortening debt maturity. One way of reducing the greater degree of shareholder/debtholder conflict likely to arise with long-term debt would be to include more accounting-based covenants in the contract.

However, this view assumes that duration and the presence of covenants are substitutes for one another. An alternative view is that a debt issue with particularly severe agency problems, for example, may both be short-term and include covenants so as to provide additional control.

As shown above, US research findings in this area are inconclusive to date. In the UK, however, we would expect that public debt with a short term to maturity is unlikely to require accounting-based covenants because of the relatively low credit risk of firms raising debt on this market. Long-term debt agreements, however, are more likely to include such covenants as there is always the risk of a deterioration in a company's credit rating over a 20 or 30-year period. In addition, the focus of UK insolvency law on protection of secured creditors makes it all the more important for long-term unsecured creditors to protect themselves with timely default triggers in the form of accounting-based covenants. This expectation is further reinforced by the strict adherence to priority of claims in UK insolvencies. As a result, in contrast to the US, long-term unsecured creditors in the UK can entertain no expectation of being repaid in priority to secured creditors in liquidation.

Convertibility and Seniority

In the US most convertible debt is also subordinated (Van Horne, 1989, p. 618) whereas in the UK both unsubordinated and subordinated convertible debt issues are common. This allows the

effects of convertibility and seniority to be disentangled from one another.

The expected relationship between convertibility and accounting-based covenants is not clear. Jensen and Meckling (1976) argue that convertibility produces a greater alignment of interests between shareholders and debtholders, so reducing the need for protective covenants.⁶ Smith and Warner (1979, p. 141) point out, however, that the underinvestment problem is more severe when convertible debt is present, which would suggest a positive association between convertibility and covenants.⁷

The effect of subordination is also unclear *prima facie*. Arguably, agency problems are relatively more severe for subordinated debt due to the fact that it ranks behind senior creditors and is therefore in greater need of protection against shareholder activities that transfer wealth away from debtholders. On the other hand it could be argued that, by having agreed to lend on a subordinated basis, these debtholders are aligning their interests more closely with those of the shareholders. The fact that the subordinated bonds studied here are all also convertible lends support to this latter view. Furthermore, in the UK, where strict priority of claims is adhered to, it is unlikely that subordinated creditors will benefit much from accounting-based covenants. This is because, even when default is triggered, the great majority of the firm's creditors have to be fully paid before the subordinated creditors can receive anything.

Data and research design

Public debt issues are identified from the 'Bond, Debenture and Loan Stock Issues' section of Exel Financial's *Record of Takeovers, Offers and New Issues* for the four years 1987-1990. Building societies, banks, water companies, subsidiaries of overseas companies and Unlisted Securities Market companies are excluded from the analysis in order to reduce the diversity of the population.

The sample includes secured debt, convertible debt and bonds—the term 'bonds' being used to designate all unsecured, non-convertible issues. A total of 145 debt issues are identified as meeting these criteria.

Where a firm has made more than one debt issue during the period, all issues are retained in the

⁵This priority is further strengthened by various provisions of the UK insolvency law (see Lingard, 1989, pp. 93 and 159).

⁶Stokes and Whincop (1993) provide empirical support for this view with their finding that Australian preference share issues generally place less reliance on covenants if they are convertible.

⁷Whittred and Zimmer (1986) and Stokes and Leong (1988) find borrowing limitations to be universal among Australian convertibles. However, such covenants are a requirement of the Companies Acts and the Australian Associated Stock Exchanges.

analysis only if the types of debt are significantly different. This is to avoid double-counting virtually identical debt agreements where a firm has multiple issues of the same type of debt.⁸ Where such multiple issues take place, only the latest is selected for inclusion. This process eliminates 29 of the original 145 debt issues, leaving 116 cases.

Details of the covenants are obtainable from the offering circular, prospectus or Extel card containing the listing particulars. The results of this study are based on data for the 108 cases (93% of the 116) for which these documents and share prices are available. Owing to the inclusion of different types of debt issues by individual companies, these 108 debt instruments were issued by 90 different companies.

A covenant is counted as 'accounting-based' provided at least the numerator or the denominator is based on numbers derivable from the main financial statements. Thus covenants found in debt agreements secured by a fixed charge, such as those requiring the value of the secured properties to be not less than a certain multiple of the secured loan, are not included as accounting-based covenants.

Debt secured by a fixed charge is classified as 'fixed' even if it has a floating charge as well. It is classified as 'floating' only if there is no fixed charge.

Following Myers' (1977) observation that book values refer to assets already in place, the relative size of assets-in-place is measured by the ratio of book value of equity to market value of equity (see also Gaver and Gaver, 1993).

Gearing is calculated as the ratio of the book value of gross debt (both short and long-term) to market value of the firm's equity. Since lenders will be interested in the firm's gearing after the new issue has taken place, the book values of debt are taken from the section of the debt issue document detailing group capitalisation. In many cases this figure includes the new issue itself and, in these cases, this is the amount used. Where the capitalisation total does not include the new issue its value has been added in, except where the stated purpose of the issue is refinancing where there is a zero net effect on total debt.

A problem with the gearing measure is that where firms have off-balance sheet finance their gearing ratios will be understated. Where possible,

this is taken into account. Some debt issue documents contain details of liabilities such as guarantees for third party debt, debt of off-balance sheet subsidiaries and non-capitalised finance leases. Where such amounts are disclosed they are included in the debt figure. While undisclosed off-balance sheet debt cannot be included, Duke and Hunt (1990), Press and Weintrop (1990) and Skinner (1993) all find a significant relationship between balance sheet-based gearing measures and accounting-based covenants.

For the measure of term to maturity, optional earlier redemption by the firm itself is ignored since this will not necessarily be exercised and therefore does not reduce the risk to the bondholders. In some convertible bond issues, however, the bondholders have an option to require redemption before the conversion/maturity date (a put option).⁹

Results

Descriptive Statistics

Table 1 shows that, of the 108 debt issues analysed, 42 (39%) took place in 1987. Convertible issues are particularly numerous in that year, while unsecured non-convertible bonds and notes predominate in 1988 and 1989. Convertible issues return into fashion in 1990 in the form of convertible capital bonds.

The industry sector breakdown of the sample appears in Table 2. Firms in the industrial materials/construction, multiple stores and property sectors account for 46% of the issues.

Of the 108 debt agreements, 32 contain accounting-based covenants, 47% of these being by firms in the brewery and property sectors (see Table 2). The amounts issued range from £5 m to £320 m, with a mean value of £85.1 m. The mean value of the 32 issues with accounting-based covenants of £84.1 m is very similar to the mean of £85.5 m for the 76 issues without. While public debt issues account for only a small part of all companies' sources of funds in the UK (see footnote 1), for those companies that do enter this market, public debt is a significant source. For the 108 debt issues studied here, the mean ratio of the amount of debt issued to the company's total debt is 0.26, and the mean ratio of the amount issued to book capital employed (debt plus book capital and reserves) is 0.11.

⁸Debt issues are treated as significantly different either if they are of different types, i.e. secured, convertible or bonds; or, in one case, where the debt is of the same type but the terms to maturity are significantly different (seven and 25 years). In order to verify that the inclusion of more than one issue of the same type of debt by the same firm would result in duplication of contract provisions, the documents of nine 'additional' debt issues by eight different firms were checked. One of these issues contained accounting-based covenants and eight did not. In all cases the information on covenants was identical to that in the debt issues actually included in the sample.

⁹For example, Slough Estates plc's £150 m 6% convertible bond issued in April 1988 has a final redemption date of May 2003. However, a further condition states: 'The holder of each Bond will have the option to require the Company to redeem such Bond ... on 20 May in any year from 1993 to 1998 (inclusive) at its principal amount together with supplementary interest ...'

Table 1
Number of Public Debt Issues by Type of Debt: 1987-1990

<i>Type of debt:</i>	1987	1988	1989	1990	Total
Secured fixed	7	2	5	2	16
Secured floating	1	—	3	1	5
Convertible:					
Subordinated:					
Capital bonds	—	—	1	8	9
Other	7	1	2	—	10
Unsubordinated	16	2	1	3	22
Bonds	11	12	18	5	46
	<u>42</u>	<u>17</u>	<u>30</u>	<u>19</u>	<u>108</u>

Table 2
Summary of Industry Sector Classification of Firms Making the 108 Debt Issues

<i>Industry description and group number*</i>	<i>No. of issues with covenants</i>	<i>No. of issues without covenants</i>	<i>Total</i>
Industrial materials (11); bricks (12); cement and concrete (15); contracting and construction (18); electrical (19)	2	10	12
Aerospace (21)	1	1	2
Radio and TV (36)	1	1	2
Motor components (41); motor distributors (42)	1	1	2
Breweries (45)	4	1	5
Hotels and caterers (47); leisure (48)	—	4	4
Food manufacturing (49)	—	5	5
Food retailers (51)	3	6	9
Newspapers and periodicals (52)	1	2	3
Packaging and paper (54)	—	4	4
Multiple stores (58)	1	10	11
Health and household products (67); general chemicals (68)	—	4	4
Oil and gas (70)	1	5	6
Transport and freight (72)	1	2	3
Industrial conglomerates (73)	2	—	2
Property (86)	11	16	27
Miscellaneous financial (87); mining finance (92); overseas trade (97)	3	3	6
Telephone networks (88)	—	1	1
	<u>32</u>	<u>76</u>	<u>108</u>

*Stock Exchange Actuaries Security Group Numbers.

Accounting-based Covenants

Table 3 shows the small variation in the types of accounting-based covenants found in these public debt documents. Of the 32 documents containing such covenants, 29 (91%) include a gearing covenant, and 18 (56%) include a restriction on the amount of secured and/or other priority debt to

capital and reserves. A third covenant, asset disposals/assets, also appears in 18 (56%) of the 32 documents, but no other accounting ratio is included in more than a small minority of cases.

The majority of the various gearing covenants are affirmative, i.e. they apply at all times while the debt is outstanding (see Table 3). However, five of

Table 3
Types of Accounting-based Covenant: Frequency of Occurrence ($n = 108$ Debt Agreements)

	<i>Affirmative covenants</i>	<i>Negative covenants</i>	<i>Total number of occurrences</i>
Borrowings/capital and reserves	29	—	29
Secured and/or priority borrowings/capital and reserves	13	5	18
Asset disposals/assets	—	18	18
Interest cover	1	5	6
Fixed assets/secured debt	—	2	2
Assets acquired/capital and reserves	—	2	2
	<u>43</u>	<u>32</u>	<u>75</u>
	57%	43%	100%

Five other accounting-based covenants occurred, once each.

Table 4
Incidence of Accounting-based Covenants by Type of Debt

<i>Type of debt:</i>	<i>Predicted sign</i>	<i>No. of issues with covenants</i>	<i>No. of issues without covenants</i>	<i>Total</i>
Secured fixed	—	—	16	16
Secured floating	+	5	—	5
Convertible:				
Subordinated:	+/-			
With put option		—	3	3
No put option		—	16	16
Unsubordinated	+/-			
With put option		1	12	13
No put option		4	5	9
Bonds		<u>22</u>	<u>24</u>	<u>46</u>
		<u>32</u>	<u>76</u>	<u>108</u>

the limitations on secured/priority debt, as well as virtually all of the other covenants, are negative.¹⁰ Negative covenants effectively proscribe certain actions, such as the raising of additional debt or making asset disposals, unless the specified financial ratios are complied with. The five negative secured/priority debt covenants all appear in the loans secured by a floating charge. The asset disposal and asset acquisition limitations are classified here as negative covenants by definition, since they only apply if the firm makes the said disposals or acquisitions.

These findings are in marked contrast to those of Begley (1993, p. 20) who finds that accounting-

based covenants in US public debt agreements are almost universally negative. The majority of accounting-based covenants in Australian public debt agreements are affirmative, however (Whitred and Zimmer, 1986, p. 25).

The tightest borrowings/capital and reserves covenant is 1.25 and the loosest 3. Of the 29 such covenants, 14 (48%) are set at 1.75, seven (24%) at 1.5 and four (14%) at 2. No other values occur more than once.

Univariate Analysis—Secured Debt and Convertible Subordinated Debt

An examination of the relationship between security and accounting-based covenants shows, as expected, that none of the 16 debt agreements secured by a fixed charge contains such covenants whereas all five secured by a floating charge do so (see Table 4). Applying the Fisher exact test (Siegel

¹⁰The distinction between affirmative and negative covenants is an important one, albeit more so in the context of private debt agreements, as default in these contracts is more frequently caused by violations of affirmative covenants (Beneish and Press, 1993).

and Castellan, 1988) to the 21 secured issues, this difference between fixed and floating charge debt is highly significant ($p = 0.001$, one-tailed). In place of accounting-based covenants, however, 15 of the 16 agreements with fixed charges contain a covenant requiring the value of the secured assets not to fall below a stated multiple of the debt so secured, and 10 of the agreements also require the income from the secured assets not to fall below a given multiple of the interest on the debt in question.

Table 4 also shows that 36 (88%) of the 41 convertible debt issues do not have accounting-based covenants, supportive of Jensen and Meckling's argument that convertibility reduces debtholder/shareholder conflict.¹¹ Furthermore, none of the 19 subordinated convertible issues contains such covenants. These 19 documents were checked further to see if, in place of their own covenants, they are protected by reference to existing covenants in senior debt issues (see Thornton and Bryant, 1986, p. 45). No explicit reference to such covenants was found in any of the documents. Fourteen of the 19 have cross default clauses, meaning that a default on other debt would also constitute default on the subordinated debt. However, cross default clauses are virtually universal among the unsubordinated debt issues as well. These findings, therefore, further support the view that the alignment with equity interests brought about by convertibility is strengthened by the subordination feature.

At first sight, the absence of accounting-based covenants among the subordinated convertibles seems to corroborate the finding in Begley's (1993) US study of non-convertible debt that subordinated debt contracts contain fewer covenants. However, the underlying rationales appear to be different. Begley finds that the firms issuing the subordinated debt are both significantly smaller and financially weaker. Therefore the loss of flexibility that covenants would bring about for these firms would be too costly for them. In contrast, the firms with the 19 subordinated convertibles in this study are, on average, somewhat larger than the remaining 89 cases in the total sample.¹² Furthermore their mean gearing at 0.41 is significantly lower than the 0.65 of the other 89 cases.¹³ This suggests that covenants are absent from subordinated debt issues in this sample because they are less risky and therefore there is no demand for them.

¹¹The 88% result is significantly different from the null hypothesis that convertible debt is equally as likely to include accounting-based covenants as not ($z = 4.84$).

¹²The 19 firms issuing subordinated convertibles have a mean size (book value of total debt plus market value of equity) of £2.4 bn compared with £1.9 bn for the other 89 cases. The difference is not statistically significant.

¹³ t -value = 3.47, significant at the 1% level, two-tailed.

In summary, in the cases of the 21 secured debt and the 19 subordinated convertibles the presence or absence of accounting-based covenants appears to be entirely accounted for by the type of debt. It is only in the cases of the 22 unsubordinated convertibles and the 46 bonds that some issues contain such covenants and some do not. The remaining univariate results and the multivariate results will, therefore, relate only to these 68 issues.

Univariate Analysis—Bonds and Convertible Unsubordinated Debt

Of these 68 agreements, 27 (40%) contain accounting-based covenants (see Table 4). Table 5 shows that firms issuing debt with accounting-based covenants have a significantly higher mean value for assets-in-place. They also have higher gearing, although the difference here is not statistically significant, contrary to the significant results found in US studies. The positive association with assets-in-place is consistent with Skinner (1993). However, the weak relationship with gearing suggests that Skinner's reasoning, that firms with more assets-in-place have more accounting-based covenants because they are more highly geared, may not be at work in the UK public debt market. This issue is examined further in the multivariate analysis below.

Table 5 also shows, as expected, that debt agreements with a longer term to maturity are more likely to contain accounting-based covenants. Those issues with accounting-based covenants have a significantly longer mean term to maturity (19.7 versus 10.1 years). This relation is strengthened when, for the 16 convertible issues with put options, the earliest date when the put can be exercised is substituted for the date of conversion/final redemption.¹⁴

This positive association between term and the use of accounting-based covenants is contrary to Begley's (1993) US findings. However, the typical term to maturity in Begley's sample is 15 to 30 years, while in this sample it ranges from two to 44 years, including 29 issues due in under 15 years. In order to improve comparability with Begley's data set, the analysis is repeated omitting these 29 shorter-term issues. This leaves 39 cases in this sample with a term of 15 years or more. Twenty of these 39 contain accounting-based covenants and they have a mean term to maturity of 24.1 years, significantly higher¹⁵ than the 15.5 years of the 19 issues without accounting-based covenants. Thus

¹⁴The put options are exercisable at terms ranging from four-and-a-half to six years, while the terms to maturity of these 16 issues are all 15 years.

¹⁵ t -value = 5.72, a difference significant at the 0.1% level, one-tailed.

Table 5
Features of Unsecured and Convertible Unsubordinated Debt Issues With and Without Accounting-based Covenants ($n = 68$ Except Where Indicated)

	<i>Predicted sign</i>	<i>Means</i>		
		<i>With covenants ($n = 27$)</i>	<i>Without covenants ($n = 41$)</i>	<i>t- values</i>
Assets-in-place	+	0.87	0.63	-2.36**
Gearing	+	0.68	0.57	-0.91
Term:				
Ignoring put options	+	19.7	10.1	-4.78*
With put option dates ($n = 71$)	+	19.3	7.1	-6.10*

*Significant at the 0.1% level (one-tail test).

**Significant at the 5% level (one-tail test).

Table 6
Logit Analysis of the Relation Between Explanatory Variables and the Presence of Accounting-based Covenants for Unsecured and Convertible Unsubordinated Debt Issues ($n = 68$)^a

<i>Explanatory variables</i>	<i>Predicted sign</i>	<i>Coefficient</i>	<i>Wald statistic^c</i>	<i>Significance of Wald statistic</i>
TERM	+	0.233	15.214	0.0001
CONUNSUB	+/-	-1.972	5.995	0.0143
INVOPP	+	2.712	6.194	0.0128
GEAR	+	-1.113	1.587	0.2078
Model chi-square		38.85	(4 d.f., $p = 0.0000$)	
% correctly classified		83.82		

^aDependent variable = 1 if accounting-based covenant(s) present ($n = 27$), = 0 if none present ($n = 41$).

^bTERM = term to maturity in years ignoring put options

CONUNSUB = 1 if a convertible unsubordinated issue ($n = 22$),
= 0 if not ($n = 46$)

INVOPP = book value of equity/market value of equity

GEAR = book value of debt/market value of equity

^cThe Wald statistic is the square of the ratio of the coefficient to its standard error (SPSS Inc 1990, p. B-42).

the contrast with Begley's findings stands, the association between accounting-based covenants and term being negative in the US but positive in the UK.¹⁶

¹⁶All 108 agreements were further analysed for an association between the stated reason for the issue and the presence of accounting-based covenants. The stated reasons were classified, in descending order of risk, as 'expansion' (35% of cases), 'general corporate purposes' (41%) or 'refinancing' (24%). No association was found, presumably due to the irrelevance of these stated reasons relative to the long duration of the debt.

Multivariate Analysis—Bonds and Convertible Unsubordinated Debt

Logit analysis is used to explore the significance of each explanatory variable in the presence of the other explanatory variables. The analysis confirms the expectation that accounting-based covenants are significantly associated with longer term to maturity (see Table 6). Thus, in the UK public debt market, accounting-based covenants and term to maturity appear to be used as substitute control mechanisms,

while in the US they complement one another (Begley, 1993, p. 24).¹⁷

Table 6 also shows that convertibility reduces the need for accounting-based covenants even when the debt is unsubordinated. Furthermore, as expected, a high value of assets-in-place is associated with the presence of accounting-based covenants although, in contrast with previous research, there is no significant relationship with the level of gearing. These findings are consistent with the view that, among firms entering the UK public debt market, low values for assets-in-place and high levels of gearing are not proxying for high agency costs. Moreover, the findings lend support to Smith's (1993, p. 294) observation that a high level of gearing in itself will not necessarily require greater covenant protection provided it occurs in a firm with a relatively high value for assets-in-place.

This being the case, accounting-based explanations for the use of such covenants in firms with high assets-in-place may well be predominating in the market studied here. Thus, a high value for assets-in-place may result from insufficiently conservative accounting which in turn gives rise to a demand for monitoring. Alternatively, GAAP-based accounting numbers arguably provide more accurate measures of financial position in firms with higher values for assets-in-place, so increasing their use of accounting-based covenants.

Finally, while this analysis relates to unsecured debt instruments, it is relevant that some of the firms involved will also be borrowing on a secured basis. We would expect the unsecured debt of such firms to be protected by accounting-based covenants. This is because these covenants will provide an alternative source of protection for the unsecured lenders of these firms in the light of their other borrowings being protected by security.¹⁸ To the extent that a high value for assets-in-place proxies for the presence of borrowing on a secured basis, this will result in a positive association between assets-in-place and the use of accounting-based covenants. This expectation is examined by analysing the industry membership of firms that borrowed on a secured basis in the current sample. The 21 cases of secured debt shown in Table 4 were issued by firms in only six industry sectors.¹⁹ The

sub-sample of 68 debt instruments which excludes secured debt includes 23 debt issues by firms from these six industry sectors. Using membership of one of these sectors as a proxy for the likelihood of having previously issued secured debt, the value of the assets-in-place ratio for the firms making these 23 debt issues is 1.13, significantly higher than the 0.52 for firms in other sectors.²⁰ This lends support to the view that the positive association between assets-in-place and accounting-based covenants reflects the demand for protection by unsecured lenders to firms that have previously borrowed on a secured basis.

Conclusions

This paper examines the incidence of accounting-based covenants in UK public debt issued during the period 1987–1990. Many of these instruments will still be outstanding well into the 21st century. Thirty percent of the debt agreements contain accounting-based covenants, 57% of which are affirmative. This is in contrast to the US where public debt covenants are almost universally negative. This suggests that accounting-based covenants contained in UK public debt agreements have more potential for influencing management's accounting policy choices than those in US public debt agreements and, as a result, their study is especially relevant to accounting policy research.

Again, in contrast to the US, the presence of accounting-based covenants in unsecured debt is positively associated with term to maturity. It is suggested that the more frequent use of accounting-based covenants in longer term debt in the UK reflects the relatively high credit quality of firms raising funds on the UK public debt market, with credit risk being related to long terms to maturity. This need for unsecured longer-term debt to be protected by accounting-based covenants is reinforced by UK insolvency law which, unlike the US Chapter 11 procedure, favours secured creditors and adheres to strict priority of claims.

Unlike the US, again, there is no association with gearing. It appears that, once the level of assets-in-place is controlled for, the gearing of firms accessing the UK public debt market is at an acceptable enough level such that it does not affect the demand for accounting-based covenants. However, the fact that the gearing measure used is unable to take account of all off-balance sheet finance may be a confounding factor.

This paper also adds to earlier research by looking at convertible debt issues. Convertibility appears to reduce the need for accounting-based covenants. None of the subordinated convertible agreements examined includes accounting-based

¹⁷The complementary nature of term to maturity and use of covenants in Begley's (1993, p. 24) data set is supported by her finding of a significant negative association between duration and gearing, while in the sample studied here these two variables are uncorrelated.

¹⁸As Stultz and Johnson (1985, p. 513) point out, while the presence of secured debt may reduce a firm's opportunities for asset substitution or cash payouts, it does not reduce the incentive for these actions if there is also unsecured debt outstanding.

¹⁹Property (13 cases), breweries (four cases), and one each from hotels, contracting and construction, oil and gas, and cement and concrete.

²⁰t-value = 7.39, $p = 0.000$, one-tail.

covenants, indicative of the strong alignment of these debtholders' interests with those of the shareholders. The small number of unsubordinated convertibles with accounting-based covenants reinforces this argument.

This paper is essentially exploratory in nature. Further testing of the various hypotheses is required, in particular whether these preliminary findings are driven by the way in which the UK institutional framework differs from that in the US. For example, an institutional factor not researched here is the question of whether public debt ownership is more concentrated in one country compared with the other. Public debt agreements can be expected to have more in common with private debt agreements where the holdings are more concentrated.

Another caveat of this study is that it uses the non-accounting-based provisions of debt agreements to help explain the incidence of accounting-based covenants, whereas all these provisions (both accounting-based and non-accounting-based) are co-determined as part of an all-inclusive package. However, it is beyond the scope of this paper to specify a complete model explaining why a particular combination of control mechanisms emerges from lender/borrower negotiations.

A final reservation is that the analysis does not take account of the possible relationship between covenants and the price of debt. If lenders trade off price against the degree of monitoring provided by covenants, then there would be a negative association. If, however, covenants proxy for the perceived risk of the debt, then the expected association would be positive since the cost of debt would be higher for riskier firms.

However, the paper does provide evidence that the factors driving the incidence of accounting-based covenants in UK public debt agreements are different to those that operating in the US public debt market. Another issue of importance to accounting researchers is that the prevalence of affirmative accounting-based covenants in longer term debt means that such agreements could influence UK corporate management's accounting policy choice for many years in the future.

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Segmental Reporting: A Preparers' Perspective

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Abstract—Following the introduction of Statement of Standard Accounting Practice 25, *Segmental Reporting*, companies must now report turnover, result and net assets analysed by geographical segments and business classes. This paper, unlike most previous research into segmental reporting, focuses on the preparers of accounts. The empirical study, based on information obtained by a questionnaire survey, has two objectives. First, to investigate the preparers' perceptions of the usefulness of segmental information and second, to identify which criteria were used to select reportable segments. The results show that the reported selection criteria have discarded or ignored many of the suggestions identified in previous academic literature and in the standard, in favour of pre-existing organisational groupings. The responses also indicate that preparers doubt the usefulness to shareholders of the reported information.

Introduction

Statement of Standard Accounting Practice (SSAP) 25, *Segmental Reporting*, became effective for UK financial statements, with accounting periods beginning on or after 1 July 1990. This standard involves companies in mandatory segmental disclosure in greater detail than previously required by the Companies Acts and the Stock Exchange Listing Requirements. Broadly, its aim is to improve the information available to users of accounts. More specifically, the standard seeks to assist users 'to appreciate more thoroughly the results and financial position of the entity by permitting a better understanding of the entity's past performance and thus a better assessment of its future prospects' (SSAP 25, 1990, para. 1a). This paper seeks to investigate the extent to which these objectives have been achieved by focusing on the preparers' perception of information. This focus distinguishes this work from previous research which has concentrated mainly on the benefits of segmental information to users. It is argued that the user's perception of reliability may be influenced by knowledge of preparers' perceptions.

The academic literature reviewed below (e.g. Gray, 1981; Cameron, 1986), ties together closely

the ways in which segments are identified and the usefulness of the resulting information. The empirical work presented here investigates both aspects. This study provides a timely insight to the preparers' perspective when they are in the process of making or have recently made decisions about publication of segmental information. Following the implementation of the accounting standard this work highlights interesting divergences between the aims of SSAP 25 and the usefulness of disclosed information as perceived by the preparers. The empirical evidence raises questions about the effectiveness of SSAP 25, since it shows that many of the surveyed preparers doubt the potential of segmental information to improve the assessment of investment risk and company performance. The evidence also suggests that preparers have not been innovative in their selection criteria for defining segments; the preference has been for pre-existing segmentation bases. It is hoped that the identification of the differences between the standard's objectives and the preparers' attitudes may be useful to preparers, regulators and users of financial statements.

The remainder of the paper is organised into four sections. The first section briefly reviews previous research and the next section identifies the research objectives and method of the present study. The third section presents the results and discusses their implications. The fourth and final section contains the main conclusions of the paper.

Previous research

To date, research into segmental reporting has largely been conducted in the US following the 1971 mandatory Securities and Exchange Commission (SEC) segmental reporting requirements and

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after the introduction of Statement of Financial Accounting Standard 14, *Financial Reporting for Segments of a Business Enterprise* (SFAS 14) in 1981. Some UK-based research has also investigated the effects of the various Companies Act and Stock Exchange Listing regulations. Useful reviews of the academic literature may be found in Gray (1981), Mohr (1983) and Cameron (1986).

Previous research has been focused in two areas. The first focus is the comparative ability of mathematical models to forecast company earnings with and without segmented results information. That is, the research question is whether users should be able to improve predictions assisted by segmental information. The second research focus is on security analysts' forecasts and may be exemplified by the work of Baldwin (1984). He describes the analysts as a useful group to focus on for three reasons. First, their decisions are a matter of public record, second, they desired segmented information, and third, they used it when it became available. Recently, in a laboratory style experiment, Emmanuel, Garrod and Frost (1989) found evidence that disaggregated data did cause the majority of their analyst participants to revise their forecasts of future profitability. Swaminathan (1991, p. 24) classifies segmental research into three categories: '(1) impact on earnings prediction, (2) impact on systematic risk, and (3) impact on security prices'.

Thus the existing academic literature has concentrated on the benefits, potential or actual, to be gained by users from disclosure of segmental data. Much less segmental reporting research has focused on the preparers of the information and Bence, Hussey and Wilkie (1992) find this to be the case in a wider context. They note that many surveys of annual reports concentrate on the sophisticated investor but tend to ignore the input of preparers of the document. Mohr (1983) argues that user uncertainty about data reliability and comparability could inhibit its use. Emmanuel and Garrod's (1987) study of preparers' and users' views is an important exception. They found that a major concern of preparers was that segmental reports should realistically reflect operations in a consistent manner over time and that neither accounting allocation problems nor issues of materiality were primary criteria for determining segments. The present study further investigates preparers' perceptions of the information they are responsible for producing. It is assumed, following Mohr, that a user's perception of reliability may be influenced by knowledge of preparers' perceptions.

Perhaps the most significant aspect of the academic literature on forecast accuracy is the importance attached to the selection of appropriate reporting segments, which is the key to obtaining useful information. Emmanuel and Gray (1977, p. 50) asked a fundamental question in relation to

the accounts of 100 UK quoted companies: 'Does the disclosure accurately reflect the scope of the business and international operations of the individual company?' Concluding in the negative, these authors were concerned about the range of disclosure practices used by companies and found that there was a problem of identifying separate classes of business, and of international operations. They argued that financial data could be rendered meaningless because information could be disguised in the process of identifying segments. Later, Emmanuel and Gray (1978) analysed a number of alternative bases for identifying segments and concluded that improved quality of disclosure could be achieved if companies were to match the organisation structure with the Standard Industrial Classification, as the basis for business class identification. However, Amit and Livnat (1990) argue that a grouping based on segment economic attributes is more valuable than industry classification.

In a study that seeks to identify the profile characteristics of companies for which disaggregated data is most likely to be useful, Garrod and Emmanuel (1988) also propose linking segment identification with data usefulness. Their conclusion (p. 146) is that 'it seems essential that identified business segments coincide with industrial sectors for which forecast statistics are available'. Finally, Hussain and Skerratt (1992) examine line of business disclosure using disaggregated data as a way of mapping analysts' special expertise of the future profitability of an industry to the consolidated profit forecast of an individual firm. In this way they argue (p. 370) that 'relevant segmental disclosure requires that the management of a company define segments in such a way that users (and, in particular, analysts) can use their specialist forecasting expertise'. Hussain and Skerratt (1992, p. 373) further argue that 'inappropriate segment definitions are a possible cause of the analysts being unable to outperform a random walk model'. The implication then drawn from this study is that reportable segments should not necessarily coincide with the company's organisational structure, since structure will not have been determined by factors relating to analysts' forecasting expertise.

Despite these research findings, Gray (1981) argues that segment definition has not been well specified on a worldwide basis and directors have been given much discretion in their choice. In fact, the lack of specific guidance to directors about segment selection has proved problematic in practice. Subsequent to the introduction of SFAS 14 in the US, dissatisfaction was noted by the Advisory Committee on Corporate Disclosure, especially in the context of identification of segments. The report of this body to the Securities and Exchange Commission in 1977 included the following:

'Because there is not a standard classification system to which reference can be made in identifying business segments, the level of segmentation has been left largely to the discretion of management. As a result the information presented has not always been as detailed as users would like' (quoted by Emmanuel and Garrod, 1987, p. 235).

Similar doubts from UK sources, also in the 1970s, are quoted by Emmanuel and Gray (1977, pp. 37-38). However, while arguing that directors may not be able to make the required links between segment definitions and the needs of users, Hussain and Skerratt (1992) do note the more recent US empirical evidence which shows that broad guidance coupled with director flexibility over segment definition does in fact lead to improved disclosure. Finally, the historical comparison of reporting practices made by Rennie and Emmanuel (1992) shows that managerial discretion may have been used to reduce the extent of geographical segmental disclosure. These authors note that a variety of disclosure practice continues to exist and argue the need for further regulation because geographic disclosure has not improved.

Consistent with the international approach, SSAP 25 places responsibility for choice of segments with the company directors, who must balance the practical task of data collection with user needs, having regard to the manner in which the company's activities are organised. In this discretionary environment, the present study examines the criteria used to select the reportable segments.

Summarising, a review of the literature shows that there has been little empirical research in the UK since the introduction of SSAP 25; most studies relate to segmental information required by the Companies Acts and the Stock Exchange Listing Requirements, or are US-based. Previous work has focused on benefits to users and especially on the needs of sophisticated users. With one small sample study being an exception, benefits to users are assessed in isolation from the preparers' perceptions of the value of the published information.

Research objectives and design

Objectives

The first objective of the paper is to investigate the perceptions of preparers of information and to solicit their views about the usefulness of the segmental data which they report following the introduction of SSAP 25. The second objective follows from the importance the literature attaches to segment identification. The empirical work aims to identify the criteria used by companies to select reportable segments and to compare them with the criteria recommended in the academic literature and in SSAP 25.

Data Collection and Analysis

The questionnaire. In terms of research method the aim was to obtain responses from a sample of company finance directors who had recently completed an assessment of their new reporting responsibilities under SSAP 25. The selection criteria were based on two factors. First, the companies chosen needed to be large enough to fall within the reporting requirements of SSAP 25 and second, since previous UK research has focused on a small number of interviews, a wider database was sought. A postal questionnaire, using closed end questions, offers ready access to a large sample of companies. After piloting by four interviews, the questionnaire was posted to a sample of *Times* 1,000 companies chosen at random. The target respondent was the financial director.

The first group of questions required respondents to assess the usefulness of the information they prepare. For this purpose the information was sub-divided into 14 disclosure categories required by the standard. These questions were answered by indicating a point on a Likert-type scale, which used 5 points to rank responses. A response of 1 was used to represent not useful/not important and a response of 5 to represent very useful/very important. The danger of using such a scale is that results may centralise around the mid point and indeed many of the mean scores are close to 3. However, the standard deviation of the data often shows that the apparent centralisation masks a varied range of responses, which are discussed in the text.

The second group of questions required respondents to identify, using a yes/no response, those criteria which influenced their choice of segments. Respondents were not asked to prioritise these criteria because pilot survey interviewees were reluctant to do so. Both groups of questions offered respondents the opportunity to expand their replies and to offer alternative answers.

Dyckman (1988) criticises surveys of this nature for two reasons. First, because the respondents may be motivated to present arguments that support their long-term goals rather than genuinely held beliefs and second, because the framing of the question may influence the response. These criticisms are recognised, as is the implication that interpretation of the results requires caution.

The sample and response rate. In total, 400 questionnaires were posted, from which 155 responses were obtained as follows: 103 fully completed questionnaires were received, and an additional 36 companies provided useful information without completing the full questionnaire; this gives an aggregate response rate of 35%.¹

¹A further 16 companies indicated a company policy of non-reply due to the large number of surveys received and the associated workload.

The fully completed responses were received from a cross-section of manufacturing, engineering and retailing companies but the financial services sector is under-represented in this group. This last sector is heavily represented in the group of 36 companies which provided some useful information, without providing a complete questionnaire. The statistical analysis is based on the fully completed questionnaires only, and the other results are discussed qualitatively in order to shed further light on the results of the statistical analysis.

The statistical tests. The statistical analysis focuses on the mean, median and standard deviations of the collected data and on testing for association between variables. The perceptions of the usefulness of segmental information are measured on an ordinal scale and consequently non-parametric test procedures are used. A sign test for paired data is used to test whether the median difference is zero, and Spearman's Rank Correlation procedure is used to test for association between variables.

Results and discussion

This section is divided into two sub-sections. The first considers the respondents' assessment of the usefulness of the information and the second examines the selection criteria used to identify segments.

Usefulness of Information

In this sub-section a number of issues are considered: the preparers' assessment of the usefulness of segmental information in evaluating past and future performance and risk; the usefulness of individual disclosures; and, finally, the preparers' overall assessment of the benefit of segmental disclosures.

Assessment of past and future performance and risk. In the introductory paragraphs, SSAP 25 explains that the disclosure requirements aim to assist users to appreciate more thoroughly the results and financial position of the reporting entity by permitting a better understanding of the entity's

past performance and thus a better assessment of its future prospects. That is, the standard postulates that future performance may be judged from an assessment of past performance. In the same opening paragraphs, the standard also notes that many entities are involved in activities with different degrees of risk. Without segmental analysis, it is held that users are unable to make judgments about the nature of these different activities or their contribution to aggregate results. To test the preparers' perceptions about these objectives, respondents were asked to assess on the Likert type scale, described above, the usefulness of segmental information for each of three purposes: understanding past performance; assessment of investment risk; and assessing future performance.

Table 1 shows that the mean scores for each of these three purposes are virtually identical. By a small margin the preparers identify the assessment of investment risk as the purpose for which the segmental information is most useful. A third of respondents (32%) indicated that the segmental information was very useful (a score of 5) for this purpose. However, the standard deviations also show that this distribution is slightly more variable than for the other purposes tested, and, in fact, 17.4% of the preparers said segmental information was not useful in assessing investment risk. The results from this survey show a positive correlation ($r = 0.84$) between the perceived usefulness of segmental information to assess past and future company performance, implying that such a relationship also exists in the minds of many, if not all, preparers, as well as being postulated in the standard.

It is widely recognised that one objective of the Accounting Standards Committee (ASC) was to reduce the differences in accounting practice between companies (Bromwich, 1980). In the standard on segmental reporting, however, the ASC appears to move away from this general objective and places more emphasis on ensuring that 'the information reported by an entity is disclosed on a consistent basis, year by year' (SSAP 25, para. 2).

Table 1
Preparers' Perceptions of Uses of Segmental Data

Uses of segmental data	Percentage of respondents scoring usefulness at					Mean score	Standard deviation	Median
	1	2	3	4	5			
Assessment of investment risk	17.4	4.9	14.6	31.1	32.0	3.5	1.454	4
Understanding past performance	13.6	12.6	12.6	37.9	23.3	3.4	1.362	4
Assessing future performance	12.6	11.7	18.4	35.9	21.4	3.4	1.317	4
Comparing performance across companies	14.6	8.7	18.4	35.9	22.4	3.4	1.347	4

Note: A score of 1 indicates not useful, 5 indicates very useful

The standard also warns that 'caution should be exercised if comparing similar segments in different entities ...' (SSAP 25, para. 2). This approach is also adopted by International Accounting Standard 14, *Reporting Financial Information By Segment* (IAS 14), which recognises that comparisons between similarly labelled segments in different enterprises would not necessarily be valid. However, in the US, Boatsman, Behn and Patz (1993) argue that the motivations for SFAS 14 were to improve comparability as well as risk/return assessments. In this context, the survey results are interesting, because Table 1 also shows that respondents' perceptions indicate they are just as convinced that segmental information is useful for comparing across companies, as for assessing the past or future performance of one company.

Usefulness of individual disclosures. Whereas the Companies Acts and Stock Exchange Listing Requirements previously mandated segmental information on turnover and profits, the standard extends reporting and specifically requires detailed information, which has been divided into seven categories for the purposes of this research: origin of turnover; destination of turnover; inter-segment turnover; an analysis of profits by segment; net assets by segment; disclosure of a group's share of associated undertakings' profits; and net assets of associated undertakings. Since each of these seven categories of information must be declared for both geographical segments and business classes, a total of 14 categories of information have been identified.

Respondents were also asked to use the 5 point scale to assess the usefulness of segmental information for each of these 14 disclosure categories. Table 2 shows the mean (in columns 1 and 3) and median scores (in columns 2 and 4) of the responses, and distinguishes between the respondents' assessment of usefulness to company management and shareholders. Column 5 shows the results of a two-tail signs test for the paired respondents' assessment of the usefulness of each category of information comparing usefulness to management with usefulness to shareholders. In each of the 14 categories it is possible to reject the null hypothesis that the median difference is zero at the 1% level. A one-tailed test indicates that in each category the assessment of usefulness to management is greater than the assessment of usefulness to shareholders. Given that SSAP 25 relates to published information that is designed for external users of accounts, this perception of greater usefulness to management is perhaps unexpected.

SSAP 25 requires information to be analysed both by geographic segment and by class of business, so that users can assess return on investment, degrees of risk, rate of growth and potential development across different geographic regions and for different products or services. The p-

values, from a two-tail signs test of paired data comparing geographic segment and business class information, are shown in brackets in columns 1 and 3 of Table 2. For both usefulness to management and shareholders, information categories' turnover by origin, profits and net assets all show a median difference which is not equal to zero at 1%. A one-tail test confirms that in these categories the business class information is perceived to be more useful than the geographic segment data. This finding is consistent with previous research, reviewed above, which shows that managerial discretion in segment definition may have been used to reduce the extent of geographical segmental disclosure.

Preparers identified disaggregated information on profits and turnover by origin segmented according to business class as the most useful information for management and gave these items scores of 3.9 and 3.7 respectively. Disaggregated profits information by business and geographic segments was identified as the most useful to shareholders scoring 3.4 and 3.2 respectively. The aggregate mean scores of 2.6 and 2.8 (in column 3) represent a preparers' assessment of published information which apparently indicates doubts about its usefulness to shareholders. This perception is examined later in the light of findings regarding the selection criteria used to identify reportable segments.

Usefulness of net assets disclosures. For the first time in the UK, SSAP 25 introduced a requirement for companies to disclose an allocation of net assets employed in geographical segments and to support business classes. This requirement, along with segment result and turnover, enables the calculation of key performance measures. This information may help satisfy one of the standard's declared purposes that users should 'be aware of the impact that changes in significant components of a business may have on the business as a whole' (SSAP 25, 1990, para. 1b). If this aim is being achieved then a strong positive correlation between perceptions of the usefulness of profits and net assets and between turnover by origin and net assets is to be expected. Table 3 shows the relevant correlation coefficients, all of which show a significant positive correlation at 0.1%.

The association between profits and net assets is the strongest relationship, and as might be expected, the relationship between turnover by origin and net assets is stronger than between turnover by destination and net assets. In each of these three categories there is a stronger relationship between the geographical categories, underlining the importance to the shareholder of the geographic segments.

Usefulness of inter-segment turnover disclosures. SSAP 25 also provides users of accounts with information about intra-group trading for the first

Table 2
Usefulness of Segmental Information to Management and Shareholders

<i>Segmental basis</i>	<i>Management</i>		<i>Shareholders</i>		<i>Sign test for paired management v shareholders p-value</i>
	<i>Mean</i>	<i>Median</i>	<i>Mean</i>	<i>Median</i>	
a) <u>Turnover by origin</u>					
Geographic segment	3.4	4	2.9	3	0.0001
Business class	3.7 (0.0146)	4	3.2 (0.0043)	3	0.0000
b) <u>Turnover by destination</u>					
Geographic segment	3.0	3	2.6	3	0.0000
Business class	3.2 (0.4240)	3	2.6 (1.0000)	3	0.0000
c) <u>Profits</u>					
Geographic segment	3.6	4	3.2	4	0.0001
Business class	3.9 (0.0072)	5	3.4 (0.0127)	4	0.0000
d) <u>Net assets</u>					
Geographic segment	3.2	4	2.7	3	0.0000
Business class	3.4 (0.0266)	4	2.9 (0.0309)	3	0.0000
e) <u>Inter-segment turnover</u>					
Geographic segment	2.3	2	2.0	2	0.0000
Business class	2.6 (0.0156)	2	2.1 (0.1250)	2	0.0000
f) <u>Associated undertakings' group share of profits</u>					
Geographic segment	2.8	3	2.4	2	0.0070
Business class	3.0 (0.0215)	3	2.6 (0.1094)	3	0.0003
g) <u>Associated undertakings' group share of net assets</u>					
Geographic segment	2.8	3	2.4	2	0.0060
Business class	2.9 (0.2266)	3	2.6 (0.0215)	3	0.0060
i) <u>Mean of all categories</u>					
Geographic segments	3.0		2.6		
Business classes	3.2		2.8		

Note: Values in brackets are the significance levels of the sign test between geographic segment and business class for each cell. The minimum and maximum scores were 1 and 5 respectively in every category.

time. The purpose of providing the information is to enable users to better understand the turnover figures where inter-segment sales and transfers are a material part of total turnover. In terms of preparers' perceptions about usefulness for both management and shareholders, Table 2 shows that this information is perceived as the least useful of all categories. In this context it is interesting to note that the one major area of difference between SSAP 25 and IAS 14 is that while the IAS requires the basis of inter-segment pricing to be disclosed, the SSAP does not. An expected correlation between the perceived usefulness of turnover and inter-segment turnover was found to be significant as is shown in Table 4.

Overall assessment of segmental information. Beaver (1977) advocates that a cost benefit analysis should be performed for all accounting standards. SSAP 25 contains no such analysis and therefore survey respondents were asked to use the Likert scale to assess the overall usefulness of making segmental information publicly available taking into consideration their perception of all the costs and benefits. The mean score was 3. Just 9% responded that public availability was very important, and an additional 29% believed that availability was important. The remaining 62% of the respondents are apparently unconvinced about the overall benefit of segmental information. A comparison of the preparers' assessment overall against

Table 3
Correlations Between Perceptions of Usefulness to Shareholders of Net Assets Disclosures*

	<i>Net assets</i>	
	<i>Geographic</i>	<i>Business</i>
Turnover by origin		
Geographic	0.605	—
Business	—	0.556
Turnover by destination		
Geographic	0.54	—
Business	—	0.386
Profits		
Geographic	0.733	—
Business	—	0.635

Note: Values above 0.311 differ significantly from 0 at 0.1%
*Spearman Rank Correlation Test

the usefulness of segmental information for the designated purposes of assessing past and future performance and risk is shown in Table 5. All three show correlation results that are significant at the 1% level, and the association between overall usefulness and understanding past and future performance is significant at 0.1%.

Also significant at this lower level is the association between the overall assessment of usefulness and the perceived usefulness of information to compare performance across companies. This is interesting because, as discussed above, SSAP 25 did not particularly emphasise this attribute.

A Spearman rank correlation shows a significant relationship between the preparers' overall assessment of the importance of making segmental information publicly available and their perceptions of usefulness of 12 of the 14 specific categories of information identified earlier. The two exceptions, which did not exhibit a significant relationship with overall assessment, were inter-segment turnover both by geographic segment and business class. As

might be expected, for each of the seven specific categories of information, there is a stronger relationship between overall assessment of the importance of making segmental information publicly available and usefulness to the shareholders, than between overall assessment of public availability and usefulness to management.

The preparers' aggregate assessment of the usefulness of segmental information scored 3 on a scale on which 5 represents very useful. From a regulatory policy perspective it is necessary to consider the implications of publishing information that apparently lacks strong support from those who prepare it. Dyckman's (1988) criticism of response bias which may lead respondents to disguise their true opinions to promote vested interests may of course be relevant here. But this survey also shows that an understanding of the segment selection criteria provides an interesting insight which may be useful to the policymaker.

Selection Criteria

The academic literature, reviewed earlier, identifies the selection criteria used to choose segments as critical to the usefulness of the information. Given the fairly low perceptions of usefulness reported here, it is interesting to contrast the actual selection criteria used against criteria identified as useful not only in academic literature but also in the professional literature such as SSAP 25.

The potential selection criteria are numerous. Emmanuel and Garrod (1987) for example, list a number of 'obvious possibilities' for the identification of segments, which include recognising legal entities, company/subsidiary relationships, organisations' structures, products or services, classes of customer and geographic areas. Paragraph 12 of SSAP 25 provides examples of factors that directors should take into account when choosing whether or not an entity operates in different classes of business. These include the nature of products and services, production processes and distribution channels, and the manner in which activities are organised. With respect to geographic

Table 4
Correlations Between Perceptions of Usefulness to Shareholders of Inter-segment Disclosures*

	<i>Turnover origin</i>		<i>By destination</i>	
	<i>G</i>	<i>B</i>	<i>G</i>	<i>B</i>
Inter-segment turnover				
Geographic	0.310		0.479	
Business		0.322		0.424

Note: Values above 0.254 differ significantly from 0 at 1% and above 0.321 at 0.1%
*Spearman Rank Correlation Test

Table 5
Correlations Between Overall Assessment and Assessment of Usefulness for Designated Purposes*

	<i>Overall assessment of usefulness</i>
Assessment of risk	0.320
Understanding past performance	0.456
Assessing future performance	0.530
Comparing performance across companies	0.464

Note: Values above 0.254 differ significantly from 0 at 1% and above 0.321 at 0.1%

*Spearman Rank Correlation Test

segments, paragraph 15 includes expansionist or restrictive economic climates, stable or unstable political regimes, exchange controls and exchange rate fluctuations. Further, the standard provides criteria that define a significant segment as one with at least a 10% share of total turnover, profits or net assets.

Using the academic literature and SSAP 25 as sources of criteria, respondents were offered a choice of 16 potential criteria and were asked to indicate any one which was used by the company to select its reporting segments. On average, companies used four selection criteria in their selection of geographic segments and five for choosing business segments. The most commonly used criteria for identifying business classes and geographic segments are shown in Tables 6 and 7 respectively. There is a marked preference for pre-existing classifications and avoidance of the more innovative criteria. For business classes the most common is 'pre-existing organisational groupings' identified by 67 companies, and the nature of the product or service identified by 53 companies.

For geographic segments the most commonly used criteria were pre-existing geographical reporting segments identified by 57 companies and well-

recognised geographic/political areas identified by 53 companies.

Compared to the potential selection basis the actual basis is restricted, and this survey draws attention to the discarded or least popular choices. Emmanuel and Gray (1977) reported that the majority of companies identified segments broadly consistent with the standard industrial classification, but found that the degree of consistency reduced as industry disaggregation increased. In this survey just 19 respondents identified standard industrial classification as one of their selection criteria. Generally, the criterion of politically stable/unstable regimes was not selected by respondents. Just two respondents indicated this category as a criterion for selecting geographic segments and just four respondents used it for choosing business classes.

Emmanuel and Garrod (1987) report small sample evidence that their interviewees identified the need to disguise dependence on politically unstable markets and to avoid scrutiny by host governments as influences on segment selection. This suggests that political sensitivity may be a reason for excluding disclosure but that stability or sensitivity is not a criteria for making disclosure. Perhaps surprisingly, given the dramatic movement in exchange rates just prior to the responses

Table 6
Selection Criteria for Business Classes

<i>Business</i>	<i>Classes No. of companies</i>
Pre-existing organisational groupings	67
Nature of product or service	53
Based on markets	20
Standard industrial classification	19
Nature of production processes	12
Segment net assets are 10% or more of total net assets	10

Table 7
Selection Criteria for Geographic Segments

<i>Geographic segments</i>	<i>No. of companies</i>
Pre-existing geographic reporting segments	57
Well-recognised geographic/political areas	53
Pre-existing organisation groupings	29
Based on markets	19
Segment result is 10% or more of total result	10

exchange rates were not identified as a specific part of the selection decision. Neither were companies attracted to the use of classifications based on expansionist or restrictive economic climates. The evidence from the pilot interviews was that respondents did not really understand how these more innovative ideas might be implemented in practice, and were unaware of their derivation from SSAP 25.

Table 8 shows the small number of companies that identified segments using the 10% limits on profits, turnover and net assets.

This supports the findings of Emmanuel and Garrod, drawn from interviews, which showed that size is only a consideration after the segment has been identified using other criteria. The results also provide some evidence to support Fraser's (1990) prediction that the 10% rule would prove problematic. He argued that internally reporting units, which might usefully be separately disclosed, would, in fact, be joined into convenient large groups. To ensure compliance with the standard, preparers and auditors would need to check, prior to publication, that chosen segments did not breach the 10% rules and therefore it may be hypothesised from these results that the failure of the 10% criteria to trigger selection of segments is because this percentage is too high.

Single Segment Companies

Despite the fact that the surveyed companies were amongst the largest in the UK, 24 companies which responded without providing a completed

questionnaire indicated that they have chosen to report as single segment organisations. Consequently, SSAP 25 has resulted in no new information being provided. Although these responses were not included in the main survey results, some of them made available information that is valuable because it offers an insight to the preparers' reasoning. This group included seven building societies, all of which indicated that theirs is a single segment business. Two of these companies used the 10% limits on turnover as reasons for determining that they do not have more than one segment.

A desire not to report segmental information was an underlying theme in 12 responses. These respondents indicated that theirs is a single segment business, but if it were not, then the organisation might attempt not to provide segmental information for another reason. Four specific responses are given here which exemplify this theme. One respondent indicated that he would use the reporting exemption given, in paragraph 6 of the standard, to companies if the directors believed reporting would be seriously prejudicial to their interests. A bank indicated that it takes advantage of the limited financial statements formats available to banks and was not under any pressure to do more as it is a private company. A third respondent said: 'The standard is so irrelevant that we would not even want to comply,' and a fourth respondent indicated that the company operates in 'one basic market, financial services' and acknowledged that 'we have taken minimum steps to

Table 8
Segment Selection Based on Size

	<i>Number of companies choosing criteria for:</i>	
	<i>Geographic segments</i>	<i>Business classes</i>
Segment 10% or more of total entity		
Turnover	7	6
Result	10	9
Net assets	8	10

conform to SSAP 25 and interpreted categories to eliminate disclosure needs'. This last preparer wrote: 'We see little use in segmental information in our particular circumstances.'

SSAP 25 places responsibility for choice of segments with company directors, who must balance the practical task of data collection with user needs, having regard to the manner in which the company's activities are organised. This survey suggests that companies have used pre-existing sub-divisions and readily identifiable groupings. In the light of previous research, particularly the recent finding by Hussain and Skerratt (1992) that organisational structure may not be a good basis for establishing business classes, users may wonder whether their needs have been sufficiently met. In addition, ethical trusts are described by Harte et al. (1991) as a trend in the 1980s which may become a social movement in the 1990s. Their findings were that these funds view segmental reporting as one of the most useful sources of information to assist in investment decision-making. The emphasis on pre-existing information and reporting lines found in this study does not appear to offer much comfort to the ethical investor.

Conclusions

From the empirical evidence it is possible to summarise two findings that may be used to form the basis for future research. First, the evidence raises doubts about whether the aims of SSAP 25 have been achieved since many preparers doubt the usefulness to shareholders of the individual elements of segmental disclosure. In addition, over 20% of respondents indicate that segmental information is not useful for assessing investment risk and company performance. Second, preparers have not been innovative in their selection criteria for defining segments. Many possibilities identified in the academic literature and in the standard have been discarded or ignored. Previous academic literature emphasises the relationship between usefulness of data to users and segment selection criteria. This survey shows that for a sample of preparers who have used very restricted and predictable segment identification criteria the resulting data is perceived as lacking usefulness. This is especially true in terms of the newly provided information on net assets and inter-segment turnover.

The survey provides some evidence that geographic segments may not be providing complete information when political sensitivity is an issue. Companies' selection criteria do not specifically include stable or unstable political regimes, expansionist or restrictive economic climates or foreign exchange controls or rate fluctuations, despite SSAP 25's apparent determination (para. 15) that such information be made available. While the reason may be that the sample companies do

not operate in such geographic areas, the user cannot assume this to be the case, and there is previous work that suggests companies attempt to disguise dependence on profits from segments which may be perceived as politically or economically sensitive. From a regulatory policy perspective the rationale for determining the limits on assets, turnover and profits at 10% needs to be clarified and the effect of changes to these limits needs to be assessed, with a view to revising this limit.

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Volume 26 Number 3 September 1994

CONTENTS

Unregulated segment reporting: Australian evidence
By G. J. KELLY

UK accounting academics and publication: an exploration of observable variables associated with publication output
By R. GRAY and C. HELLIAR

Financial controls and schools: accounting in 'public' and 'private' spheres
By J. BROADBENT, R. LAUGHLIN and H. WILLIG-ATHERTON

Issues in assessing MDA models of corporate failure: a supporting research note
By S. R. LETZA

Book Reviews

Contents of Recent Accounting Journals

The Boulton & Watt Case: The Crux of Alternative Approaches to Accounting History?

Richard K. Fleischman, Keith W. Hoskin and Richard H. Macve*

Abstract—In accounting history, authors who have adopted a 'Foucauldian' approach have recently debated with those representing the 'Neoclassical' school of thought the relative sophistication and significance of cost accounting developments in the UK and US respectively during the late 18th and early 19th centuries. This paper argues that the differences between the two schools' understandings are important for comprehending the genesis and scope of modern cost and management accounting systems. It re-examines the historical case of Boulton & Watt, an engineering firm believed to have been in the vanguard of British Industrial Revolution accounting practice (Roll, 1930; Pollard, 1965 and 1990; Fleischman and Parker, 1991), in an attempt to clarify some of the key points of difference in the debate. It proposes that the historical crux for deciding where a modern managerial approach to accounting began lies in distinguishing between the development of engineering standards for materials and machine efficiency and the transfer of such performance measurements to human behaviour. A pressing task for historians is to establish when, where, how and why 'labour standards' were first articulated on the grounds that such forms of human accounting, by constructing norms of managerial performance, form the basis for modern management control. The paper reviews the primary sources on the history of cost accounting at Boulton & Watt, including the previously-acclaimed development of labour and engine standards. Its findings are that, while the latter were highly sophisticated as measures of engineering performance, they were less so on the economic dimension of cost measurement. Meanwhile, the evidence for labour standards is unconvincing; there was, around 1800, an intense period of investigating labour time and cost, but no subsequent long-term systematic control exercised over them analogous to the modern managerial approach found slightly later in US contexts. The paper suggests that one priority for further research is the detailed examination of early industrial enterprises on both sides of the Atlantic, in order to establish more definitively when, where, how and why this crucial development occurred.

Introduction

The 'new accounting history' is a phrase that has been used to characterise an expansion of the discipline to include a 'heterogeneous range of theoretical approaches' and a 'plurality of methodologies' (Miller et al., 1991). The aims of this paper are to identify more clearly some major points of difference between one particular new approach, the 'Foucauldian', and the more traditional 'Neoclassical' perspective, as typified by two groups of authors (Hoskin and Macve on the one hand; Fleischman and his collaborators on the other); to argue how historical evidence may count in support of one or the other perspective; to explore how an individual case in accounting history may be understood from each perspective; and to offer a categorisation of these two approaches

that identifies the key issues for further research in understanding the development and significance of early industrial cost management and accounting practices.¹

The studies by Hoskin and Macve (1986, 1988a, 1988b and 1994a) have heretofore focused on the US in the early 19th century and, in particular, on developments at the Springfield Armory. They have pointed to the role played by graduates of the US Military Academy at West Point, in the Armory and on certain early US railroads, and suggested that pedagogic practices derived from West Point, translated into a business context by these graduates, became the basis for a new modern 'managerialism' based on control of individuals through 'a new way of seeing each individual

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¹We leave for a later paper the theoretical and factual arguments at issue between the Marxist/labour process school (e.g., Clegg, 1989; Hopper and Armstrong, 1991; Tinker, 1992) and other historical approaches. The philosophical gulf is deep and wide (e.g., Neimark, 1990; Hoskin, 1994); but both the Marxian/labour process and the Foucauldian schools share a concern with understanding power and human control. We suggest that the same historical crux—the nature of the development of accounting for human performance—provides the factual foundation that will determine how far each of these positions can be rationally sustained (e.g., Armstrong, 1994) and will help identify priorities for future research.

worker in terms of norms and deviations from the norm' (Ezzamel et al., 1990, p. 159). Such control is a:

'positive power presenting norms of good practice and performance against which each individual's commitment and omissions were constantly evaluated or through which some officially prescribed self-discipline could come to be internalized' (Hoskin and Macve, 1988a, p. 41).

From this perspective, the concept of a 'standard cost', such as standard labour cost per unit, represents the pioneering construction in the business context of target norms of human behaviour. Subsequent practices, such as those of Taylorism's 'time and motion' studies (c. 1880), are significant in the construction across industrial culture of 'calculable persons' (Miller and O'Leary, 1987). A crucial aspect of this approach has therefore been the attempt to explore where, when and how the discourses and practices based on 'standards' of this kind first began to transform the development of management practice—the historical discontinuity whereby the 'pre-modern' became the 'modern'.

The significance of Hoskin and Macve's attempt to identify the role of the Springfield Armory as crucial lies in their particular identification of disciplinarity as a double power that operates through certain practices (in particular technologies of writing and learning) to construct forms both of behavioural discipline and of academic disciplinary knowledge. Hence, they stress the role of educational practices in the genesis of managerialism. They especially underscore a link between new practices of writing, examining and grading under which students were required to learn at West Point from 1817, and the subsequent development by West Point graduates of technologies promoting administrative coordination and human accountability at Springfield Armory and on the US railroads from the 1830s on. Hence, in such newly managerial organisations, certain already-existing technologies, not least accounting, could generate a new social and economic power. Hoskin and Macve (1988a, p. 68) have thus thrown down the gauntlet to traditional economic rationalists by noting:

'We therefore see accounting not as the "practical" response of men faced with new entrepreneurial and organizational challenges, who "sensibly" devised ways of collecting and processing the data needed to make rational economic decisions—for in that sense no "practical" man

would have invented modern accounting practice.'²

By contrast, the work of Fleischman and his collaborators (Fleischman and Parker, 1990, 1991 and 1992; Fleischman et al., 1991; Fleischman and Tyson, 1993) and other researchers (e.g., Edwards, 1989; Edwards and Newell, 1991) has focused on the British Industrial Revolution as the cradle of modern cost management and cost accounting. The thrust of this research has been to challenge Pollard's (1965, p. 248) oft-quoted observation that 'the practice of using accounts as direct aids to management was not one of the achievements of the British Industrial Revolution'.

These studies have identified a number of examples of sophisticated early developments of cost accounting and cost management practices and techniques, including cost controls, overhead allocation and the computation of 'standard' costs—all techniques recognisably comparable to modern day practice. These studies have, at least implicitly, looked for the explanation and significance of these early practices in terms of their economic utility, coupled with the role of dynamic entrepreneurs in assisting cost reduction, profit maximisation, exploitation of new technologies and defence against competition.³

In comparing these two kinds of study, we see at the root of their major disagreements in historical explanation a difference in the identification and interpretation of one particular historical development, the normalisation of 'labour standards'. From the Foucauldian perspective, while the development of 'physical' standards, based primarily on

²Tyson (1990 and 1993) has responded by recasting the Hoskin/Macve findings into economic rationalist explanations, though questioning certain of their processes of data selection. Hoskin and Macve (1994a) have in turn challenged Tyson's interpretation of the relevant archival records.

³Both sets of authors have also not been silent about shortcomings they see in the historical theorising of rival groups. Ezzamel et al. (1990), in what was essentially a review of *Relevance Lost*, disputed Johnson and Kaplan's description of the historical importance and non-problematic development of cost and management innovations. One main contention was that evidence of cost accounting is not sufficient in itself to demonstrate its utilisation for management control and decision-making. Ezzamel et al. contended that there was an essential difference between Johnson and Kaplan's view that early cost management numbers represented objective, useful information for management decisions, and their own opinion that accounting numbers are inherently problematic. In their view, the focus of interest is not the numbers themselves but rather the processes by which the numbers and related techniques have evolved and are deployed for the surveillance and control not only of workers, but of managers by managers. From the alternative perspective, Fleischman et al. (1992) have questioned the utilisation of a Foucauldian paradigm given the enigmatic and inconsistent nature of Foucault's theory of history, his refusal to search for origins in history, his relative inattention to factories specifically and economics in general, and his failure to mention accounting even though it does appear to fit his disciplinary discourse.

engineering data and used to control 'physical' operations such as materials usage and the efficiency of machines, is relatively (although not wholly) unproblematic, the transfer of such performance measurement to human behaviour, to generate norms and standards of human performance, was a development of a different order. There was an intellectual, social and organisational leap when accounting measurement was first applied to creating labour standards.

The ultimate significance of that departure has perhaps become clear in the way that accounting measures and norms, both internal and external, have now come to permeate organisations from top to bottom, covering both labour and managerial performance. Unlike machines, human beings respond to performance measures by internalising them in forms of self-control. Such a leap, the Foucauldians argue, required the prior development of new practices and discourses in other arenas to create the conditions of possibility wherein it could take place. It was not simply a response to changing economic conditions.

To the Neoclassical economic rationalist, on the other hand, the development of such labour standards is no more problematic than the development of the physical standards. They constitute perhaps an extension of the physical, yet both are similar in their structure, purpose and approach, reflecting a rational response to the needs of economic development. That is not to say that Neoclassicists would necessarily regard the articulation and maintenance of labour standards 'simply' as a response to economic conditions, for emergent issues of labour control and industrial relations might well play important contingent roles in the articulation of such standards. However, such contingent factors would still form part of a response, required on overarching economic rational grounds, to changing real-world demands.

There is therefore a crucial need, if we are to understand the development of modern management accounting practice, for careful and detailed research to establish precisely the relative sophistication at different times and in different places of the costing techniques developed for application to materials, machines and products (engineering standards) on the one hand, and to human performance (labour standards) on the other. The historical crux lies in comprehending where, when, how and why the performance measurements, developed through engineering standards, were transferred, through the introduction of labour standards, to establish norms of human performance. This understanding will allow a better evaluation of how this innovation began to influence both individual enterprises and whole industries and developed to become the basis of modern management control.

If it can be shown, by recourse to the detailed historical evidence, that accounting and costing developments in Britain late in the 18th and early in the 19th centuries extended to the establishment of human performance norms, this knowledge would render futile the Foucauldian attempts to identify the preconditions for such a development as lying elsewhere, primarily in non-economic settings of the kind located by Hoskin and Macve (e.g., 1988a and 1994a) in the US in the early 19th century. On the other hand, if the crucial development dates from the early 19th century US, the traditional Neoclassical view of accounting's historical development as a 'demand response' to the forces of economic development (e.g., Edwards and Newell, 1991, p. 35) would be rendered problematic, for the major achievements of the Industrial Revolution originated in the UK at a time when the US was still an economic backwater.⁴

In this paper we investigate the possibility that this historical crux occurred at the Boulton & Watt (B & W) foundry, one of the classic examples of early British management sophistication. In particular, we will attempt to establish precisely the relative sophistication of the costing techniques developed there for application to human performance—the labour standards.

Of course, we remain aware that individual cases and pieces of evidence cannot be conclusive, and there will almost certainly remain difficulties of identifying and interpreting from the available historical data the precise nature of the developments that took place in the UK and US around the turn of the 19th century.⁵ But as more studies are undertaken, a careful accumulation of, and attention to, the resulting evidence should at least reduce the scope for misinterpretation of what happened, and when, and thus advance debate on the merits of alternative theoretical approaches to understanding modern accounting's history.

Ultimately, through such a process, there might conceivably even be resolution to what at present appear to be irreconcilable theoretical differences. In undertaking this project we did not purposefully seek either reconciliation or debate. Earlier studies (e.g., Roll, 1930; Dickinson, 1937 and 1967;

⁴A further issue is the timing of US developments. Miller and O'Leary (1987) argue that the significant development occurred with 'scientific management' from the 1880s onwards. Hoskin and Macve (e.g., 1988a) argue, on the basis of evidence from the Springfield Armory, that the crucial development occurred in the period 1832–1842, and that 'scientific management' was a later articulation of practices established some 50 years earlier.

⁵Moreover, while we attach particular importance to the issue of labour standards as the historical crux, resolving the differences between two overall patterns of historical understanding of accounting's development clearly requires consideration of a whole mosaic of events and their explanations over a long period of time (e.g., Hoskin and Macve, 1994b; Fleischman, 1994).

Pollard, 1965 and 1990; Fleischman and Parker, 1991) have already emphasised the sophistication of the accounting and costing practices developed at B & W. The present authors, from their differing paradigmatic backgrounds, have jointly revisited the archive in order to re-assess those existing interpretations and to identify additional material that sheds light on the labour control issue.⁶

The structure of the remainder of the paper is as follows: the next two sections briefly outline the historical significance and development of the B & W works and the general background of its accounting practices; the following two sections focus on the nature and the relative sophistication of the techniques developed for labour standards and engine standards respectively. The final section assesses the significance of this evidence within the Foucauldian and Neoclassical approaches to accounting history and suggests research priorities for resolving the questions that have emerged in recent years.

B & W: history and literature

The importance of the firm founded by the famed steam engine partnership and perpetuated by their talented scions has been well documented by economic and accounting historians. Roll's (1930) classic study drew attention to apparently sophisticated scientific management and cost accounting techniques at B & W, but did not presage subsequent study of the British Industrial Revolution as a formative epoch in the development of modern managerial methods. The apparent dismissal of these innovations as the exceptional approach of a single firm was given more concrete expression by Pollard whose extensive knowledge of the period's business archives led him to the pessimistic conclusion quoted above. At the same time, he did identify B & W as an 'astonishingly fertile pioneer of scientific management practices' (Pollard, 1965, pp. 79, 248; 1990). Fleischman and Parker (1991) qualitatively rated B & W excellent in all four of the cost accounting activity areas that they identified—cost control, overhead accounting, decision-making and standard costing.

During the firm's early phase, 1775–1795, the primary focus of operations was not the manufacture of steam engines but consulting engineering—the planning for, and supervision of, the erection of engines. A significant percentage of the engine components was subcontracted to outside producers. The firm received royalties calculated at one-

third of the saving in coal costs realised from the greater efficiency of its engines compared to the Newcomen machines in common use.

B & W's early revenue collection technique necessitated elaborate record-keeping systems, not only on its part but by its clients as well. To ensure its fair return, B & W needed monthly data on the productive potential of its engines, actual utilisation and the coal consumed in the operation. These were recorded in exquisite detail in the early 'engine books'. Commencing in 1782, B & W patented the rotative engine, which required the firm to manufacture a greater proportion of engine parts internally.

In 1795, the Soho Foundry commenced operations for the full-scale production of steam engines. The new installation reflected the apogee of scientific management practice in a physical sense with its carefully planned production flow, component and process standardisation, and the subdivision of labour. With the termination of most external subcontracting, accounting innovations could serve an important new purpose in controlling and coordinating the wide variety of labour skills necessary to construct a highly complex commodity (Pollard, 1965).

With the opening of the Soho Foundry, B & W's fortunes came to be guided increasingly by the founders' sons. James Watt, Jr., in particular, had been trained in management and accounting skills (Fleischman, 1993). Because of the impending expiration of many of its patents in 1800, survival of the firm increasingly depended on efficiency (Roll, 1930). Techniques were necessary to ensure highly precise workmanship, stock control and accurate costing of materials and labour processes. Pollard (1965, p. 252) was impressed by B & W in that 'solutions to these problems, consciously adopted, have rightly been compared with the best practices of the 20th century'.

Cost accounting at B & W

The size of the B & W archive reflects both good fortune and the firm's commitment to volume data generation.⁷ Accounting information was produced in great quantity to support the management innovations at the Soho Foundry. Dickinson

⁶This re-examination of the archive has enabled us to offer a more detailed and comprehensive evaluation of the material than was reported in Fleischman and Parker's more general survey (1991) or in Hoskin and Macve's observations (1988b, Appendix) on Roll's (1930) conclusions. Roll's study did not extend beyond 1805.

⁷Historians are fortunate that a substantial volume of B & W records survive from the late 18th and early 19th centuries. This archive, along with the Carron Company's records, is the most extensive the current authors have seen for an Industrial Revolution enterprise. The efforts of the archival staff at the Birmingham Central Library, where the firm's manuscripts are housed almost in their entirety, have made these important materials easily accessible to users. As with all archival records, however, it must be remembered that the accidents of survival mean that it is likely that there is also a substantial amount of material that has not survived and this material, if available, might have altered the overall picture that we have drawn from the evidence available.

(1967, p. 168) wrote with characteristic hyperbole, reiterating Roll (1930):

'There is nothing in the costing, the feeds and speeds, the scientific management of Taylor, Ford, and other experts of the present day that was not found at Soho before 1805. This early engineering works possessed an organization that far excelled that of any other extant establishment and that can bear comparison with that of any works of the present day.'

The bulk of B & W's accounting innovations occurred around the turn of the 19th century, necessitated by the decision to produce locally components that had previously been externally subcontracted. A new accounting system was accordingly developed to control the new productive processes, with functions now delegated to internal subcontractors.

In their qualitative analysis of 25 large Industrial Revolution firms, Fleischman and Parker (1991) identified activity or excellence in the four broad topical areas previously mentioned. However, the list could well have included other criteria such as a firm's integration of cost and financial records, evidence of a causal relationship between *ex ante* analyses and actual business decisions, and systems that functioned over a sufficiently extended time frame so as not to be considered *ad hoc*.

The relative completeness of the B & W archive permits a closer look at some of the activity areas identified by Fleischman and Parker. Rather than devote attention to accounting practices apart from the articulation of material and labour standards, we find, in summary, that while B & W kept detailed records of expenses, classified by activities, the absence of a high level of sophistication in allocating overhead, and the lack of any direct evidence of whether and how comparisons between individual managers' performance might have been made, suggest that the purpose of the records was primarily for expenditure control rather than to support a system of devolved responsibility management.⁸

⁸For example, B & W clearly extended the scope of cost consciousness by not just tracking product costs but by requiring that departments submit weekly expense reports. This system enabled a rigid separation of expenses rightfully chargeable to the owners' capital accounts and an appropriate dichotomisation of raw material and overhead supplies charges. Quite how these reports were used, however, remains uncertain. On one hand, they were clearly fed into the financial reports since we find a breakdown of 'general expenses' in the annual accounts. Annual comparisons of the cost of different types of oil and candles were also made. However, it is unclear to what extent, if at all, they were used as a feature of day-to-day management since we could find no indication that managers were made answerable for their expense control.

Concerning the use of depreciation, we again found a confused picture. B & W began a process of cost recovery on its

In the next two sections we focus on B & W's development of labour and material standards—the source of its reputation amongst historians. Here the crucial question, it seems to us, is the extent to which the company set, appraised and controlled standards of human performance, as well as developed standards of physical performance for its engines. Neither the evidence nor the interpretation of these activities is straightforward.

On the one hand, both human and machine performance were measured in considerable detail across a range of activities, particularly over the 1800–1802 period when the Soho manufactory was extended. It is clear that standards were derived as a means of evaluating the weight of castings produced per man per month, as a means of establishing time-based piece rates in procedures such as turning and boring, and for evaluating piece rate-based tenders submitted by inside contractors in the manufactory. There is also evidence that the setting of such piece rates increased productivity. On the other hand, this evidence is not necessarily, *ipso facto*, proof that a managerial system was in place and operating.

In this regard, it is particularly important to recognise that 'standard' can take different shades of meaning in both engineering and accounting terminology, and one must be careful not to read back modern meanings into earlier usages. At the simplest, a standard may signify little more than an 'average' found, for example, by measuring samples of past activity. Thus, the average cost of batches of a product may be calculated, and again be averaged over a number of periods. This amount may then be used as a 'standard' measure of the cost (e.g., for tendering purposes, for internal transfer pricing or for inventory accounting) even though it may soon cease to reflect actual costs. One might label such calculations as 'positive' (tracking what is) rather than 'normative' (tracking what should be).

In the context of labour, piece rates may be set by averaging observations of actual rates of output over a period or periods, and then utilised as a benchmark or standard for future production (perhaps setting a lower standard to provide achievement bonuses or a higher standard if there is

depreciable assets in 1806, but in a confused fashion. While declining balance depreciation was used in one inventory book (Arch. 05/1/430), we found none at all before 1815 in a building and machinery book. Thereafter different rates were used before a standardisation in the 1820s. In this area, therefore, the development of an 'accounting eye' was not a self-evident and straightforward process. Similarly with overhead allocation, the system in use appears to have been aimed at expenditure control and cost-plus pricing decisions since overhead was included in the mark-up on finished goods. However, the firm's accountants did not allocate these costs to departments. Overall therefore, there is no evidence from these cost data that they were used for comparisons between managers or feedback control over them.

believed to be considerable slack in current rates). Here there is an overlap between positive and normative attributes—what has been achieved in the past is a guide to what should be achieved, or surpassed, in the future.

In the engineering context also the positive and normative meanings may again tend to overlap. The purpose of measuring the level of output from an engine, or the pattern for a component, is normally to control activity by testing for deviations from the standard and taking corrective action where needed. The standards are both positive, descriptive of the capability of the machine, and normative, targeting what should be achieved (allowing for any special conditions of operation). But these parallels between human and engineering standards do not necessarily mean that the labour standards generated at B & W were used managerially, as a means of 'human engineering', exerting constant accountability over performance. Such accountability is typically built upon precision of measure, the fine gradation of hours, minutes, seconds and even sub-seconds required for a task. It presupposes a regular revision of standards and targets and an integration of activity throughout the workplace, whether achieved by hierarchical imposition of order or through the planning of productive throughput. A managerial system, in short, will appear to be more than the sum of its parts. At B & W, however, the whole often appears to be rather less than some of its parts, taken individually, might suggest.

Labour standards

B & W, thanks in great part to Roll's early investigation, is renowned in cost accounting history both for its extraordinarily detailed engine books and for its articulation of labour standards based on time studies. However, it now appears to us on re-examining the archive that B & W's labour standards represent only a limited development. In particular, while there was an incredible outburst of calculating activity in the 1800–1802 period, there was considerably reduced attention subsequently.

In the early history of the firm, all B & W workers received day wages as befitted an operation that featured little in the way of production. A significant proportion of labour expense was incurred by engine erectors who spent much of their time in the field, and were thus beyond much direct control by management. Starting with the opening of the Soho Foundry in the mid-1790s, the transition was made to more complex remuneration arrangements, particularly a piece rate structure. Roll (1930) attributed this development to the greater standardisation of products and specialisation of labour that accompanied the new installation. Roll also observed

that circa 1800 some operatives received day rates at the Engine Manufactory whereas those performing the same function at Soho were paid by the piece.

Time Studies and Piece Rates

The correction of this anomaly was based on the time studies for which the firm is noted. Abraham Storey, Watt Jr. and the younger Boulton were prime movers in this activity at the turn of the century. However, the process did not cease with the initial establishment of the piece rate system. It continued under the auspices of Haden in the 1810s and Buckle in the 1830s. A typical exercise was a compilation wherein the monthly weights of castings made between October 1799 and June 1800 were reconciled to information from the time book for the four processes involved in making castings. The weight per man per week was then compared to what was the 'average weight supposed by Mr Storey to be made per each man per week'. In three of the four instances actual production fell short of expectation, but in the case of open sand casting, weekly output exceeded Storey's norm (Box MII/7/2). These results became the 'basis to the table of premiums'. A premium system was superimposed on existing day rates and represented a 10%–16% bonus to the foremen of operative teams for completion of an agreed quantity of output. The premium structure was in place by July 1800, two years in advance of the fully articulated piece rate scale (Roll, 1930; Tann, 1981). As of 1802, B & W's workforce numbered 54 operatives, 20 working for day wages and 34, organised into nine teams for internally subcontracted functions, receiving piece rates (Tann, 1981).

The process for establishing piece-work rates was intricate and lengthy. The first step was observation. Roll (1930) reported a rather simplistic procedure for the establishment of drilling rates in 1801 wherein the performance of a single worker, not a particularly efficient one at that, was observed. Apparently, exogenous factors, such as faulty castings and machinery malfunctions, rendered piece rates determined in this fashion next to worthless. However, documents that the current authors have seen in the archives provide evidence of a more thoughtful time observation process. In Box 37/3, there is an almost illegible document listing 'time of turning' for five product classifications (e.g., pistons and rotative shafts) with a 'proposed standard or average' for each.⁹

In some instances, a standard was proposed on the basis of a single trial, but as many as four repetitions were observed for certain categories with quarters of a day as the lowest unit of

⁹The document is undated but others in the box are dated circa 1800.

measurement. In these cases of multiple observations, an average time was struck, but again this average was never denominated for less than a quarter day. A proposed standard time was then given wherein the standard was usually less than the average observed time. Of 56 individual cases, the standard proposed was less than the average observation on 33 occasions, the same on 18, and higher in only five instances.

A more impressive time study was entitled 'Table of the times of boring cylinders with observations thereon 1800' (Box 37/3). Here a surface area was calculated for 16 sizes of air pumps. The accounts were then consulted to calculate the average actual time to produce the pumps. A ratio between the surface area and the actual days was derived and expected days formulated on that basis. However, the ratio was deemed inadequate because the facing of the cylinder and other parts of the operation did not appear in direct ratio to the surface area. A better approach was suggested wherein estimated expected days were derived by adding 72 to the surface area and dividing that result by 30.

Tenders for Internal Subcontracting

In 1802, Thomas Mousley received an internal subcontract to produce pumps, pipes and other specified items on a piece rate basis. This contract was the end product of a complicated process that demonstrated the B & W system at its most sophisticated. B & W solicited bids from the foremen of various operative teams on the items in question. For instance, Box 45/19 contains no fewer than four bids for moulding shafts from Croft, Williams, Middleton and Meadows. To test the bids interviews were held. Box 45/20 contains details of how an agreed price for each part was built-up on the basis of interviews with Mousley as to the time required. Notes were taken on Mousley's views. Storey (B & W's inspector) doubted that some of the times could be achieved based on what he had seen (in some cases more time was allowed). Then the costs were worked out, with a deduction of one-eighth (written in different coloured ink) being made 'for piece work' to get the price finally agreed.

The build-up of the 6 s piece-rate standard for cold water pumps is typical of the process (Box 45/20). It was agreed between Mousley and Storey that 'a moulder can do one in a day, or six per week'. Weekly pay plus premium for Mousley and his two helpers was 34 s, or 5/8 d per pump. The cost of chipping, getting out, and weighing was 4 d per cwt., or 1/1 d for a pump weighing 3 cwt., 1 qtr.

From the 5/8 d, the standard one-eighth (9 d) was subtracted to convert to the proposed piece rate, giving 4/9 d (sic). Thus, the standard was established at 6 s (4/9 d + 1/1 d) (sic). Although the arithmetic leaves something to be desired (albeit

coming right in the end), the process was typical of similar computations for working barrels, pumps with jackheads, clack seats and various types of pipes.

With regard to boiler steam pipes, an analysis over five quarters was done on Mousley as a low bidder to gauge his productivity and efficiency (Box 45/19). These quarterly summaries were very detailed with costs based on day labour rates plus premiums then in effect. A major issue was the incidence of 'wasters', unusable output. Calculations were jointly made on the basis of actual waste and no waste. Most piece rate proposals from the foremen assumed that B & W and the subcontractor should split the waster cost, but ultimately the final contracts passed full waste cost absorption to the contractors (Tann, 1981). In any event, Mousley's performance was judged to be 'tolerably industrious' during the first and third quarters, and less so otherwise. It was also observed that he had been helped by foundry labourers and chippers without chargebacks.

The five quarter cost analysis revealed a bottom line materials and labour cost of 2/1½ d per cwt. for pipes based on day rates. The standard deduction of one-eighth to convert from time rates to piece rates (here taken to be 3 d) brought the price to 1/10½ d (rounded up). Had there been no wasters, the cost would have been 1/9 d per cwt. However, the firm conceded a 1/10½ d base for pipes, in essence giving him 1½ d gratis, a cost that would have been 'unnecessary had he not lost so many by his ignorance or neglect'. To this sum was added 4½ d for foundry labour, chipping and 'getting out', costs which Mousley would now have to absorb in addition to wasters.

However, it was then observed that a 2/3 d per cwt. standard for all pipes would result in cheating, putting 'temptation in his way', because variations in thickness of the pipes would materially impact costs. Thus, a table was constructed wherein rates were established per foot of pipe as a function of differing inside diameters (from 4 inches to 13 inches). Because all fractions were dropped, the resulting table was as much in B & W's favour as the 2/3 d per cwt. cost had been in Mousley's. These pipe piece rates then appeared on the long list of the products subcontracted to Mousley (Box 45/20).

Piece Rates and Productivity

The degree to which the piece rates benefited B & W can be measured by comparing the final rates to the various proposals. The prices agreed are about one-third below those in Mousley's proposals.¹⁰ The competitive bids submitted by Isaac Croft also survive (Box 45/20). There are

¹⁰Strangely, Mousley's tender is apparently dated 21 July, the day after the discussions at which the agreed prices were determined.

20 items that appeared jointly on Croft's proposal and the final piece rates contracted with Mousley. On only three occasions were the piece rates offered higher than Croft's bids. Typically, the final rates were significantly lower than those Croft was able to offer.

Another detailed study involved the production costs incurred by William Williams and his men in making air pumps, cylinders and condensers from dry sand patterns (Box 45/18). Again, production over five quarters was scrutinised. Actual labour expense at day rates was £177/14/4½ d. Had the same work been done at proposed piece rates, the labour input would have cost £125/11/7 d, a saving of £52/2/9½ d. It was observed that by taking castings at the Leeds price of 2 s per cwt., the amount would be £5 more than Williams' proposed piece rates.

It might also be observed that in the establishment of these piece rates, B & W did not operate in a vacuum. The company had knowledge of moulders' rates at other firms. Box 45 contains corresponding piece rates for 1802 at Butterley, Low Moor, Gorsecote and Halifax (Tann, 1981).

Roll (1930) was of the opinion that the institution of the piece-rate system in 1802 was designed to speed-up individual operatives' production. An analysis of Samuel Williams' production in the second quarter of 1802 contrasted his earning potential under a new piece-rate proposal with the old day wages plus premium arrangement. The conclusion was 'so that to earn his present wages he must do one cwt. per day more than has yet been done and 1½ cwt. more than he did in the quarter from April to June, 1802'. This diagnostic must have been particularly disconcerting to Williams as his production appeared to have been approximately two cwt. a day (Tann, 1981; Box 45/1).

A lengthy document in Box 45 (Tann, 1981) underscores the productive speed-up that accompanied the final institution of the piece-rate system on 17 July 1802. For each of the moulder teams doing castings, there appears a statement of production over the eight preceding quarters with comparison to the first several months of the new system. There is commentary on each with regard to earning potential under piece rates. The final page of the document, that appears as Figure 1, illustrates the remarkable output increase under the new method. It was not only Samuel Williams who more than doubled his output. The system resulted both in greater productivity for the benefit of the owners and also in increased pay, indicating that there had been considerable slack in the previous system.

Revisions to Piece Rates

However, to modern eyes there is a surprising sequel to this apparent breakthrough. The close

attention paid to the introduction of piece rates in the 1800–1802 period was not reflected in the decades following. Amendment of the 1802 calculations did not apparently occur until 1808. In that year there appeared a 'revised calculation of cylinders 4 to 6 H [horsepower] sliding valve engines' wherein the estimate of the time required to produce a unit of this output was raised from 1½ to 1¾ days. For the first time a 'risk of boring' cost, constituting one-twelfth of the piece rate, was added (Tann, 1981; Box 45). In that year as well, internal subcontractors agreed that piece rates on certain categories of pipes were too high and accepted a 3 d per cwt. reduction retroactive to the previous year (Arch. 05/1/451). A more general amendment of material and labour standards occurred in 1810. Interestingly, while the revision contained some information about the build-up of material standards, there was no documentation at all to support labour piece rate changes (ibid.).

The apparent lack of concern with regard to managing labour piece rates was underscored in 1814 when a strike was threatened over pay levels. Watt Jr., in responding to the unrest, pointed out rather cavalierly, 'settlement of the piecework has for several years been made annually at the periods when it was convenient to me' (Tann, 1981, p. 14).

This 'unmanagerial' approach to labour cost control appears to have continued over ensuing decades. A huge volume called the *Piece Workers' Ledger* (Arch. 05/1/443) exists for 1825–1830 wherein 40 pages are given over to the productivity for Edward Seager for a three-year period. Job numbers are typically given for the work he did on specific accounts. His remuneration appears to have been some combination of day rates and piece-rate premiums. His output was recorded in weight with the job order charged sometimes by the weight only and sometimes by the weight multiplied by a standard rate. Another book from the 1830s entitled *Instructions for Assembling Engines and Estimates* (Arch. 05/1/480) contains 35 pages of labour piece rates, but is most inconsistent in providing estimates of the time that specific functions were expected to take.

Imprecision in Calculations

Even in 1802, when piece-rate calculations were a first priority, the time observations on which rates were based seem to have lacked precision. Box 45 contains a listing of time estimates for various moulder's functions in the manufacture of a 20-horsepower engine. For all tasks requiring more than a single day, the allocated times were in half-day units. Quarter-days were specified for moulding smaller components requiring less than a day. Given the intricacies of other calculations observed at the time, it would, from a modern viewpoint, seem almost inconceivable that hourly estimates were not attempted (Tann, 1981).

However, it appears that quarters of a day remained the normal unit of measurement. A rough calculation on a scrap found in the back of the Fitting Book for 1809–1837 (Arch. 05/1/283) has one task measured at three-eighths of a day, but since the final total is rounded to a quarter fraction, not added exactly, it appears that the clerk was not used to working in fractions smaller than one-fourth.¹¹

In 1814, Haden did time studies for the turning, cutting and finishing of wheels of various sizes. In this particular document there are 20 estimates, six of which were done without trial. For the remaining 14, which were based on Haden's own experiment, there was no repeat testing (Box 48/4).

There is some evidence that this apparent laxness may have resulted not from a lack of care or concern, but from the intrusion of factors that made it functionally impossible to assign accurate time estimates. An 1804–1806 document logs the cost of fitting pairs of rotative and connecting wheels. Even when the dimensions of the wheels were the same, the costs could vary wildly. For instance, one pair of wheels of four feet and two feet diameters respectively cost £4/4 s, while another pair of exactly the same dimensions cost £0/16/6 d (*ibid.*). At the same time, such factors seem inadequate to explain the constant and long-standing absence of a concern with tracking and shaping labour time. The limitations of the firm's time records, and perhaps of the piece rates based on these observations, is reflected by a comment that appeared in an 1830s instruction book (Arch. 05/1/480, p. 73):

'The exact time put down by Mr. Buckle must not always be taken for the real time a job has been in completing, but in many instances and indeed in general the person who makes out the fitting must be governed by his knowledge of the article fitted.'

The Contractual Roles of Piece Rates

Nevertheless, labour cost estimates were needed for pricing jobs, and the 'Estimates Book 1819–1826' (Arch. 05/1/481) previously referred to includes for each job the costs for various labour processes, giving the time required and charged out at various standard rates of pay. The effort put into establishing piece rates and tracking labour costs therefore appears to reflect primarily contractual needs, both internal agreements for the production of engine parts and external contracting with customers for the delivery and installation of engines.¹²

Conclusions on B & W's Labour Standards

While the introduction of piece rates itself appears to have achieved a dramatic improvement in productivity, the exercise was a 'one-off' to establish a new system of 'fair prices' that thereafter received only sporadic attention. There does not appear to be any evidence of meticulous control over subsequent productivity, and the piece-rate regime seems essentially that described by Johnson and Kaplan (1987) when they argue that entrepreneurs did not need cost accounting, even when coordinating multiple processes in proto-factories, as long as they were paying market prices (a piece rate) for the output of each worker. Similarly, detailed attention to control and efficiency of labour was not needed until manufacturers attempted to take the manufacturing process out of the hands of internal contractors, operating on a piece rate basis, and to bring the workforce under their direct control.

From a Neoclassical (economic rationalist) perspective therefore, it would have to be argued that external conditions (competition, etc.) and internal conditions (the nature of B & W's technology and factory organisation) had not yet developed to a stage requiring a more sophisticated approach to control of labour efficiency. The productivity increase associated with the introduction of piece rates may have been sufficient to deflect management's attention from more precise standards and more frequent revisions of existing ones that may have served to alienate the labour force. From the Foucauldian perspective, the important observation would be that the piece rate system at B & W provided incentives to increase productivity but it did not represent a continuous 'disciplinary gaze'. It was not yet a management system of the modern kind, 'systems that quietly order us about' (Foucault cited in Megill, 1979, p. 493).

Engine standards

The approach to the setting and maintenance of labour standards at B & W compares unfavourably with that adopted for engine standards. Indeed, the most impressive surviving documents in the B & W archive are the dozens of engine books. These huge volumes contain costings of all components for every major steam engine constructed at the Soho Foundry. There is a printed form for each, numbering six pages in length during the late 1790s (Arch. 05/1/231) and seven pages during the 1810s and 1820s (Arch. 05/1/409). The standard costs of the hundreds of components comprising these engines were painstakingly entered and organised therein.

Engine Trials

The original founders were interested not only in premium payment calculations but in the

¹¹The 3/8ths are not included in the intermediate sub-totals either, which are each stated as an amount '+ 3/8'.

¹²See also the 1801–1802 estimates cited by Wells, 1978, pp. 73, 77 and Appendix 3.

comparative efficiency of their engines as well. The early archives feature hundreds of pages on the results of engine trials. Performance efficiency remained a concern for the second generation ownership though there was apparently diminished experimentation. An 1818 notebook of Watt Jr. is replete with steamboat engine trials (MI/6/25). A box labelled 'steam engines' contains 'expectations' for all boilers made at Soho in 1824–1825 with particular reference to the coal consumption per cubic foot of water.

Perhaps because the firm had developed sufficient expertise in its products' capabilities, the emphasis came to centre more on product costing. In 1802, Stoner, Pearsol and Halligan individually analysed the cost and selling price of fly wheels. There was substantial variation in the three estimates of cost. The document is particularly interesting in that on two occasions, in 1807 and again in 1809, newer cost information was pasted over the original calculations (Box 45/19).

One of the most sophisticated comparative costings is one from the 1830s where a two-page analysis of 'cost of articles to form a 13H engine upon a 10H framing' is followed by corresponding costs for a 10-horsepower size. There then follows a differential cost analysis highlighting the variations between the two (Box 42/12).

Costing Imprecision

There is much to admire about the accounting system utilised by B & W in costing the hundreds of components comprising the major engines constructed at Soho. The detail apparent in the huge engine books with seven pages allocated to each engine does impress. The fact that the firm employed transfer prices distinct from selling prices suggests a sophistication absent in most other Industrial Revolution firms. However, the more deeply the researcher investigates these records, the more certain limitations appear.

Details of the New River Company Engine are recorded in an 1824 engine book (Arch. 05/1/251) with associated costs abstracted over the typical seven printed pages. 'Fitting' costs total £644/14/5 d and constitute a page and a half in the abstract. In the corresponding fitting book (Arch. 05/1/283), greater detail is provided about this cost aspect. However, the fitting book total is misadded by £185, an error picked up in the engine book but never corrected in the fitting book. A listing of costs also appears in an Engine Day Book (Arch. 05/1/259) wherein the material inputs are listed by weights multiplied by a standard charge. These standards appear to be quite imprecise as they are always rounded to the nearest shilling and on some occasions to the nearest five shillings. The labour cost is given only as a single line item without specification.

In tracing items produced in the foundry from the day book (Arch. 05/1/272) to the engine book (Arch. 05/1/251), it is apparent that the transfer prices to the foundry account were not the same as charged in the final abstract. For instance, for job VT304 (1824), the connecting rod charge for a 13 January entry was 12 cwt., 7 lbs. at 16 s per cwt., while a 29 September entry in the engine book costed the same component at 18 s per cwt. Once again, confidence in the precision of these standard costs is undermined by the rounding and the grouping of various component costs at convenient numbers. This concern is confirmed by an 1820s inventory book where selling prices for cast iron goods in fitted state are examined over the decade. Prices in inventory in 1822 do not change until a re-assessment was undertaken in 1830. Then, all items that had been charged at 32 s per cwt. in 1822 are lowered to 28 s, all 20 s items are now 16 s, and those that had been 18 s and 15 s are reduced by only one shilling (Arch. 05/1/438).

Conclusions on B & W's Engine Standards

The engine standards computations therefore exhibit a high level of attention to detail in terms of the physical properties being measured and experimented with, but a somewhat more cursory treatment of the associated costs. One explanation for this pattern may be that, although the computation of actual or average cost in money terms is technically similar to the computation of actual or average output in physical terms, the logical categories of the two operations are different. Physical efficiency is, by and large, correlated with observable changes in controllable physical conditions, while cost, as a measure of economic efficiency, is also affected by often unpredictable and unknown economic factors, both internal and external. A past measure of physical output as a guide to future output is more reliable and useful than a computation of past cost as a guide to future cost. Moreover, the inevitable arbitrariness of allocations of joint costs (Wells, 1978) renders individual product costings themselves arbitrary, and for many economic decisions it is marginal not average costs that are relevant. However, a jobbing contractor like B & W does need cost estimates as a basis for quoting 'fair' prices to customers, and it is this contracting function of accounting that is a particularly important feature of the B & W costings.

From the Neoclassical (economic rationalist) perspective, it would be argued that the major emphasis on technological efficiency, and related but subsidiary emphasis on costs, was an appropriate response to the conditions facing the firm at the time. The differing aspects of development of engine and labour standards may also be understood as reflecting the much greater difficulty of measuring and standardising human efficiency than machines.

Such a view, however, leaves for further interpretation and explanation the subsequent development of, and debate over, full 'standard costs' of production in the late 19th century (Solomons, 1968; Wells, 1978). From the Foucauldian perspective, the development of engine standards by B & W, paying greater attention to the physical than to the cost dimension, may also be seen as an essentially unproblematic technological development. Again, as under the Neoclassical view, it is the later 19th century focus on the idea that standards could fully measure 'true cost' that needs explanation. From the Foucauldian viewpoint, this later sophistication makes sense, together with the development of systematic labour standards, in the light of the prior introduction of routine practices for recording and grading human performance, practices that had engineered a new power of surveillance, judgment and performance control within organisations. Cost ascertainment and control would therefore focus, not on cost as an objective engineering datum about a product or process, but on cost as a construct of routine managerial practices. As such, its value lay in its ability to contribute, within more generalised systems of accountability, to the pursuit both of constant internal cost/quality optimisation and of effective external competitive advantage.

Conclusions

The development of accounting at B & W exhibits two main stages. During the years when the founders were at the helm, the accounting functions, though numerous, did not manifest particularly sophisticated characteristics. The concern with expenditure control was a natural first step for firms in the forefront of Industrial Revolution cost accounting methodology. The record-keeping associated with the plethora of engine trials and experiments was at a high level, but was linked more to the engineering than to the cost accounting function. The data categories maintained in the early engine books served the sole purpose of providing support for computing the annual premiums owed to B & W based on coal cost savings. It would appear that accounting during this formative period was related entirely to purposes of an external economic and, in particular, of a contractual nature.

Conditions changed radically in the last five years of the 18th century. The coming of age of the younger Watt had a positive influence on the firm's utilisation of cost accounting, and, like other UK industrial entrepreneurs, he was in the vanguard of accounting developments (Fleischman, 1993). The cessation of external subcontracting and the associated construction of the new Soho Foundry altered the firm's requirements to control and

account for the material and labour inputs of its engines.

The 19th century accounting experience at B & W was in some respects paradoxical and quixotic. The firm deployed certain cutting-edge accounting techniques (e.g., depreciation and transfer pricing), but did not exploit them in a consistent manner. The company tracked indirect expenses carefully, but failed to allocate general charges to productive departments according to pre-determined formula, a practice which was evident amongst leading iron manufacturers during the period (Fleischman and Parker, 1992). We have seen the flourish of activity circa 1800–1802 that resulted in the establishment of labour piece rates and the costing of hundreds of different engine components. Great efforts were seemingly expended in this regard, but the process petered-out in later years. This petering-out could be explained, from a Neoclassical viewpoint, as resulting from an essentially economic calculus—the cost-benefit ratio of the effort involved in updating costs and piece rates on a regular basis was not worthwhile. From a Foucauldian viewpoint, however, it would represent a failure to establish the disciplinary gaze of a management system of surveillance.

So, above all, the B & W archives suggest a marked difference in the attention paid to material and labour standards following their initial introduction. The firm manifested a far greater concern with component costing than with unit labour costs. The engine books continued to be maintained in exquisite detail. The business records contain numerous product costings into the 1830s. Overall, therefore, considerably more detail seemed to accompany material than labour inputs.¹³

The major finding of our re-interpretation of the B & W archives is essentially a negative one. Upon close examination the accounting there did not reflect the sophistication one might have anticipated given the firm's highest rating in the Fleischman and Parker (1991) survey. The accounting techniques may still have been amongst the best that the period had to offer as suggested by the research of Roll (1930) and Pollard (1965 and 1990). However, the labour standards were clearly not the sophisticated means of control of human performance that exemplify modern managerial systems of accountability.

Although the crux of alternative approaches to accounting history has been argued to be the development of such modern standards, B & W itself remains a case where the historical interpret-

¹³It has been observed that material standard prices in inventory did not fluctuate between 1822 and 1830, but it must be recalled that although the period was one of falling prices, B & W was not positioned in a highly competitive industry such as iron or textiles where profit margins were continually in focus.

ations of both Neoclassicists and Foucauldians are still possible. The former would look to the conditions of labour organisation and argue that the economic cost-benefit calculus was not yet sufficient to demand such sophisticated developments in control of human performance (or to evaluate them as valuable once invented for other reasons). The latter would argue that it was only when the discursive conditions of possibility were created by developments in other spheres (such as the educational developments that took place shortly afterwards in the US) that the development in control of human performance could take place, in otherwise largely similar labour conditions, as, for example, at the Springfield Armory in the 1830s.¹⁴ In respect of this particular case, however, the jury is still out.

On the nature of the labour standards, we have been able, by further examination of the archive, to shed more light on what was previously a considerably confused issue in the literature. While there is clear evidence of the application of a set of normalising practices to 'rate setting' in the time-studies of 1800–1802, on the basis of which piece rates and internal subcontracting prices were set, the relative lack of precision and the failure to follow up this experiment are even more striking. The original time calculations were based on evidence of variable quality about time worked and do not have the kind of precision one might anticipate, being recorded not even in hours but in half-day or quarter-day units. Thus, there appears to have been no managerial system of administrative co-ordination developed to produce feedforward or feedback data on the rates.

The initial impression of the current authors that, given the presence of time trials, time experiments and detailed production data, there must have been a 'managerial gaze' permeating the factory and controlling the performance of the employees proves on closer inspection to have been

far from the case. Our conclusion therefore is that the B & W piece-rate exercise was a one-off to establish a new system of fair prices that thereafter received only sporadic attention.¹⁵ And even for this one-off, the experiments, while they might be called time-studies of a kind similar to those later undertaken at the Springfield Armory in the US under Roswell Lee (Superintendent from 1817), were nowhere near approaching the rigour of the 'time and motion' studies that were to be undertaken at the Armory in the 1830s, 'watch in hand', and that introduced a new managerial discipline of a modern kind (Hoskin and Macve, 1994a; cf Tyson, 1990 and 1993).

Such negative findings are important in the context of the debate over the genesis of modern management practice. As we have discussed, a major difference of interpretation within accounting history between the Neoclassical and Foucauldian schools has centred on how each interprets the development of labour standards. The former see this process as a gradual, continuous and natural development led by engineers. (Moral judgments regarding this pattern philosophically divide them and the Marxist/labour process school.) The stumbling block for such economic rationalists, however, as Wells' work (1978) identifies, is that the engineers produced accounting numbers that, although they seemed 'natural', could lead to economic nonsense. Yet, management might continue to base decision-making on these bogus numbers confident that economically rational actions were being undertaken.

The Foucauldian school would regard the 'scientific' approach to control of human performance, exemplified by Taylorism, as a cultural leap that only took place when discourses and practices, first deployed in other arenas, made it possible. It was not natural and inevitable, and it is no surprise that the numbers have always been problematic.

While standardisation and efficiency seem of the essence of mechanisation, translation of these concepts to human activity is much more problematic. To come to treat human performance like that of a machine, functioning as if it is observable, measurable and controllable in terms of efficiency, is to create a new discourse and a new way of seeing, describing and controlling the world.

It is, of course, possible to argue that these viewpoints are simply different histories necessarily illustrating different aspects of the emergence of such modern phenomena as managerialism and cost accounting. Such a view, as Stewart (1992) has suggested, would simply be a case of 'pluralising our past'. However, just because there are different kinds of history with different theoretical

¹⁴In evaluating the developments at Springfield as representing a crucial step forward in terms of measurement of norms of human performance, as compared with B & W (and with the earlier piece-rate regime at Springfield), one could point inter alia to the rigour of the experiments first undertaken in 1831, 'watch in hand' to establish 'the exact time necessary for ... each particular task' (some tasks being less than a minute in duration and all being timed to the second, or even to tenths of a second); to the combination of piece-rate payment with a strict time work-discipline to ensure a regulated 10-hour working day; and, of particular importance for the historical significance of these developments, to the strategic role of Springfield as the public sector forcing house for innovations, both technological and managerial, which were then diffused to the private sector arms industry, not least because private sector contractors had to compete with Springfield's costs as the benchmark. Moreover, the developments at Springfield can be located within a nexus of managerial developments traceable to the influence of West Point and its graduates which was also significant in the history of the US railroads (Hoskin and Macve, 1988a and 1994a).

¹⁵Another British one-off experiment in costing occurred at Etruria under Wedgwood beginning in the 1770s (McKendrick, 1970; Hopwood, 1987; Pollard, 1990).

perspectives does not mean that all are equally valid. Even in a theoretically sophisticated world, many apparently major differences come down to the evidence. Often, a sufficiently reflective formulation of the key points of difference, coupled with a diligent search of the available evidence, may resolve what are otherwise defined as essentially theoretical differences. Therefore, in weighing the merits of each viewpoint, it is important to try and ascertain just what was achieved, when, where, how and why.

As in all history, and from whatever viewpoint, 'time is of the essence' (irrespective of what Foucault himself might or might not have said about origins) and a priority for research in accounting history is therefore now to establish the precise sequence of development that led to the widespread adoption of the standards for measuring human performance that are the basis of modern managerial control. Herein lies the importance of continuing to research as many of these significant early industrial enterprises as possible in the UK and US, and indeed in Europe, around the turn of the 19th century.

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Contents

Worrying about Accounting in Health Care

Guest Editors

WAI FONG CHUA and ALISTAIR PRESTON

Abstracts and Keywords

Worrying about Accounting in Health Care

by WAI FONG CHUA and ALISTAIR PRESTON

Counting Health Care Costs in the United States: A Hermeneutical Study of Cost Benefit Research

by LESLIE S. OAKES, JUDITH CONSIDINE and STEVEN GOULD

The Contemporary Discourse on Health Care Cost: Conflicting Meanings and Meaningful Conflicts

by PATRICIA J. ARNOLD, THERESA DAVIS HAMMOND and LESLIE S. OAKES

The Great Experiment: Financial Management Reform in the NZ Health Sector

by STEWART LAWRENCE, MANZURUL ALAM and TONY LOWE

Recent Financial and Administrative Changes in GP Practices in the UK:

Initial Experiences and Effects

by RICHARD LAUGHLIN, JANE BROADBENT and HEIDRUN WILLIG-ATHERTON

Audit Judgments of Revalued Non-current Assets: The Effect of Conflicting Risks

Jenny Goodwin and Ken T. Trotman*

Abstract—This paper reports the results of an experimental study concerning the effect of conflicting risks on the audit of revalued property assets. It is likely that the views of clients concerning the appropriateness of a valuation will be in conflict with those of interested third parties such as lending institutions or debenture holders. The pressures imposed by clients and third parties were examined experimentally by manipulating two factors in a 2×2 between-subjects design. These were the risk of breaching a debt covenant and the risk of losing the client, with high and low risks for both variables. Owner-occupied property and an investment property were revalued by a hypothetical client company. Subjects were asked to estimate the number of hours the audit team would spend on the audit of each asset and also the likelihood that the valuations would be accepted as reasonable. For the planned audit hours, results indicated a strong interaction effect between the two factors, with auditors planning to spend significantly more time when both the risk of breaching a debt covenant was high and the risk of losing the client was low. Similar results were found for the likelihood judgment that the valuation would be accepted as reasonable.

Introduction

The revaluation of non-current assets has become an accepted accounting practice in many countries, including the UK, Australia and New Zealand (Glautier and Underdown, 1991; Whittred and Chan, 1992; Wilson, 1992). Such revaluations have implications for the auditor who must express an opinion on the truth and fairness of a set of financial statements. Traditionally, fixed assets have been regarded as a low-risk audit area, requiring the application of reasonably routine verification procedures. However, when assets are revalued, auditors must decide whether or not they will accept a valuation as reasonable and how much evidence they will gather to support their decision.¹

This paper reports the results of an experimental study undertaken in New Zealand which examines the audit of revalued property assets.² Because

of the lack of prior research in the area, a series of structured interviews³ was undertaken with audit partners prior to developing the experiment. The hypotheses tested are generated from both the relevant literature and from the results of these interviews.

This study considers the situation in which auditors are faced with two conflicting risks that are likely to exist simultaneously in the audit environment. The first is the threat of litigation arising from the client's breach of a debt covenant and the second is the threat of losing the client. The study examines auditors' responses to high and low levels of these risks in a situation where there is no single decision that can be regarded as the correct one, namely asset revaluations. These two factors in the audit environment are also likely to have justification consequences. Gibbins and Emby (1985) suggest that the ability to justify or defend decisions to various audiences is regarded by many auditors as an essential quality of sound professional judgment. In this case, the views of the different audiences (creditors and the client) are likely to differ so that an acceptable justification to one audience may result in conflict with another (Messier and Quilliam, 1992; Hirst, 1992).

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¹Revaluations can be both upward and downward. Only upward revaluations are considered in this paper.

²In New Zealand, the relevant accounting standards are SSAP 28, *Accounting for Fixed Assets* and SSAP 17, *Accounting for Investment Properties and Properties Intended for Sale*.

The former permits systematic revaluations of classes of fixed assets while the latter requires investment properties to be revalued on an annual basis. In both cases, any revaluations are required to be undertaken by a registered valuer on the basis of their net current value. This is defined as 'the price for which an asset might reasonably be expected to be sold at the operative date, less the costs of disposal that could reasonably be anticipated' (SSAP 28, para. 3.8).

³Further details of these structured interviews are provided in Goodwin (1993).

The paper also extends the literature on audit independence by examining the effect of these competing pressures on auditor judgments. Specifically, it extends the study by Farmer et al. (1987) who examined the effect of non-accounting variables such as the potential risk of litigation and the loss of a client on auditor judgments at different levels in a CPA firm. The present study uses a different context and has a number of significant differences in research methods.⁴

The paper is structured as follows. In the first section, the relevant literature is reviewed, followed by the development of hypotheses in the second section. The research methods are summarised in the third section while the fourth contains the data analysis. In the final section the implications of the findings are discussed and some conclusions are drawn.

Literature review

A number of accounting choice studies have demonstrated that there are managerial incentives to revalue non-current assets. Brown et al. (1992) hypothesise that, the closer the firm is to violating a debt covenant, the greater the probability that it will revalue in order to lower its debt/equity ratio. Whittred and Chan (1992) claim that revaluations provide a low-cost mechanism for reducing problems arising from under-investment (Myers, 1977). They contend that the likelihood of revaluation is positively related to the existence of borrowing limitations, financial leverage and the value of growth opportunities and is negatively associated with cash retention (i.e. the availability of internally generated funds).

Empirical research conducted in Australia by both Brown et al. (1992) and Whittred and Chan (1992) generally supported their hypotheses. These findings were further endorsed by Easton et al. (1993) who conducted a telephone survey of chief financial officers (CFOs) of a sample of Australian firms in order to determine the motivations for revaluating assets. They report that 'the desire to lower the debt-to-equity ratio was often cited as the primary motivation for asset revaluations' (p. 6). Some CFOs advised that debenture trust deeds that contained debt-to-equity covenants were in place and asset revaluations helped these firms to stay within borrowing limitations.

These studies suggest that the amounts recorded for revalued assets in the financial statements may be biased by management's desire to produce a certain outcome. It is anticipated, therefore, that

auditors will be primarily concerned that their decisions regarding a valuation are defensible and can be justified if subjected to scrutiny. This view is supported by a survey undertaken by Gibbins and Emby (1985), which, as noted above, found that auditors regard the ability to justify a decision as an essential quality of sound professional judgment. Emby and Gibbins (1988) contend that the need to justify a decision may result in evidence gathering and analysis being undertaken not only to enable a decision to be reached but also to support the judgment once it has been made. Therefore, the need for justification is expected to affect both the quantity and the nature of evidence gathered to support a decision. However, auditors are accountable to a variety of different audiences, and an acceptable justification to one group may result in conflict with another (Messier and Quilliam, 1992). As far as asset revaluations are concerned, it is likely that the views of clients concerning the appropriateness of a valuation will be in conflict with those of interested third parties such as lending institutions or debenture holders. This situation can place auditors under severe pressure because both clients and third parties can take legal action against them and clients can also change auditors.

While only a few studies have addressed these issues, the evidence suggests that being held accountable to different audiences is likely to have an impact on auditors' judgment processes and decisions (see Messier and Quilliam, 1992). A number of writers have argued that auditors are strongly motivated to gain the approval of their clients in order to retain them (Serlin, 1985; Simon and Francis, 1988; Church, 1990). As Serlin (1985) acknowledges, 'the fear of losing an important client is a real one to an auditor' (p. 76). Church (1990), however, recognises the potential conflict faced by auditors because the motivation to keep the client may be offset by the threat of litigation which, as demonstrated by DeAngelo (1981), could damage a firm's reputation, resulting in the loss of other clients.

Nichols and Price (1976) argue that the presence of non-routine tasks involving more discretionary judgments is likely to increase auditor-client conflict and place greater pressures on the auditor. They also contend that another cause of auditor-client conflict is the coercive manner in which the client perceives a third party may use an unfavourable audit report. These arguments are particularly relevant for this study because client management may be motivated to revalue in order to improve the appearance of the balance sheet to third parties. Further, as there is no single correct valuation, considerable discretionary judgment may be exercised regarding the reasonableness of the amounts recorded. The auditor is required to consider the source data, assumptions and methods used by

⁴Changes in the research methods include the use of a between-subjects design, the use of different dependent variables and, most importantly, a design that allows for the testing of interactions.

the valuer in deciding whether the valuation is reasonable.

Farmer et al. (1987) examined the effect of competitive pressure on audit judgments and whether the perceptions of auditors concerning independence issues varied according to their position in the audit firm. They contend that 'there is concern that competitive pressures may subtly (or even unknowingly) cause auditors to compromise their independence on accounting issues' (p. 2). However, they suggest that a learning or 'acculturation' process may take place resulting in partners and managers adopting different value structures than those of lower ranks. Farmer et al. investigated the impact of potential litigation and the potential loss of a client on auditors' judgments involving acceptance of the client's treatment of a novel transaction not covered by a professional pronouncement. Results indicated that both variables influenced auditors' decisions on whether they would accept the proposed accounting treatment. There also appeared to be interaction effects, with subjects agreeing with the client most often when risk of litigation was low and risk of client loss high. On the other hand, when the risk of client loss was low and that of litigation high, only two out of a total of 78 subjects indicated that they would accept the client's position. A limitation of Farmer et al. (1987), however, is that the independent variables were tested on a within-subjects basis, thus giving rise to possible demand effects.

Development of hypotheses

Risk of Breaching a Debt Covenant

Creditors can take legal action against the auditor if they believe that the values in the balance sheet are materially overstated. While such action will only be taken in the event of a default on outstanding debt, arising from failure or insolvency, the auditor should be concerned to minimise any risk of litigation. This risk will be perceived by the auditor to be greater if the client has contracted with creditors to adhere to borrowing limitations and these debt covenants are then breached. The client, on the other hand, may have incentives to overstate the value of its non-current assets in order to reduce contracting costs. The accounting choice literature indicates that, the closer a firm is to violating a debt covenant, the greater the probability that the firm will revalue upward, thereby reducing the debt/equity ratio (Brown et al., 1992). The structured interviews conducted with audit partners revealed that many are aware of managerial incentives to revalue.⁵

When a revaluation appears to have been undertaken to improve balance sheet ratios, the auditor's primary concern will be to ensure that the valuation is reasonable, thus minimising any threat of litigation by creditors. The auditor can be expected to adopt certain justification procedures in order to support the decision taken and defend the course of action should the need arise. Emby and Gibbins (1988) argue that these procedures may occupy a considerable amount of the time involved in the judgment process because evidence gathering, consultation and analysis may all be undertaken not only to enable a decision to be taken but also to support the decision. This would suggest that, when the threat of litigation increases, the need for justification also increases. It can be hypothesised, therefore, that the auditor will plan to spend more time on the audit of a revalued asset when the likelihood of litigation by third parties such as creditors is greater. It can also be argued that the auditor is less likely to accept a valuation as reasonable when there is an increased risk of being sued by third parties. These actions result because the costs of litigation are far-reaching, involving not just the immediate costs of defending a lawsuit and the possibility of having to pay damages, but also longer term costs resulting from loss of reputation (DeAngelo, 1981; Church, 1990).

Two hypotheses are generated from the above discussion:

H₁: Auditors will plan to spend more time on the audit of a revalued non-current asset when the risk of breaching a financial covenant is high compared to when the risk is low.

H₂: Auditors will be less likely to accept the valuation as reasonable when the risk of breaching a financial covenant is high compared to when the risk is low.

Risk of Losing the Client

Clients can impose serious pressures on auditors that may adversely influence audit decision making, and these are likely to be greater when the tasks under dispute involve more discretionary judgments (Nichols and Price, 1976). While professional standards identify certain procedures that the auditor should undertake when auditing revalued assets, the potential for conflict can be significant because there is no single correct valuation. A compounding factor is that valuations are normally undertaken by an independent expert who has been appointed and paid by the client. As a result, the client can be expected to resist any valuation

⁵Goodwin (1993) shows that the possibility of overstating asset values and the motive for the revaluation were the two most frequently cited considerations when assessing audit risk associated with a revaluation. Further, a number of respondents

specifically mentioned the possibility of management bias, resulting from a desire to improve the appearance of the balance sheet in order to facilitate borrowing or to adhere to the terms of debt contracts.

dispute by the auditor. The difficulties faced by auditors in this regard were made clear in the structured interviews with partners conducted by Goodwin (1993).⁶

Auditors who face the possibility of losing a client are more likely to be persuaded to accept the client's point of view than those auditors who do not face that fear. This is especially so in the area of revalued assets when auditors can justify their decision by claiming that they relied on a report issued by an independent expert. It is therefore hypothesised that, when the risk of losing the client is high, auditors will be more likely to accept the client's wishes with less questioning of the valuation, and therefore spend less time on the audit of the revalued asset. Auditors are also more likely to indicate that they expect to accept the valuation as reasonable. Based on the above arguments, the following hypotheses are suggested:

H₃: Auditors will plan to spend less time on the audit of a revalued non-current asset when the risk of losing the client is high compared to when the risk is low.

H₄: Auditors will be more likely to accept the valuation as reasonable when the risk of losing the client is high compared to when the risk is low.

Research methods

Case Development

The research instrument involved a case study developed by the authors.⁷ Background information and financial statements were provided for a hypothetical manufacturing company client that had revalued its owner-occupied land and buildings and an investment property. The background data contained information about the company's management, its products and its operations.

Both owner-occupied and investment properties were revalued upward. Different accounting standards cover these assets and investment properties are required to be revalued annually. This requirement was used as management's justification for changing the accounting policy for the owner-occupied property, so that both assets would be carried at their net current value.

Audited financial statements for the two previous years were given together with the unaudited statements for the current year. Relevant extracts from the notes to the accounts were summarised, including details of revenues and expenses, term

liabilities and the asset revaluations. The company was shown to be making adequate profits to ensure that this was not a confounding issue when auditors assessed the appropriateness of the valuations. For each of the revalued assets, a detailed valuation report prepared by an external valuer was provided.⁸ Pilot testing was undertaken at critical stages of the process of developing the instrument as well as when the document was in its final form.⁹

Independent Variables

The two independent variables were the risk of breaching a debt covenant and the risk of losing the client. The manipulations for both of these factors were undertaken by varying the background information and financial statements. For the first factor, subjects were advised that unsecured debentures had been issued in accordance with a debenture trust deed containing a number of financial covenants, and, as auditor, they were required to provide a certificate to the trustee stating that these covenants had not been breached. Specifically, total liabilities should not exceed 65% of total tangible assets and secured liabilities should not exceed 35% of total tangible assets. The manipulation involved one set of financial statements where the level of debt was such that, without revaluing the non-current assets, total liabilities would exceed 65% of total tangible assets.¹⁰ In the other set of financial statements, the amount of liabilities was less so that there was no risk of breaching the financial covenants. Pilot testing confirmed the validity of the manipulation.¹¹

The risk of losing the client was manipulated by varying the introduction to the case scenario. All subjects were advised that the client company had been audited by their firm for the past six years and they had been the partner-in-charge for the past four years. One group of subjects was informed that the client was very satisfied with their performance as auditor and was always very receptive to any suggestions and recommendations they made relating to accounting and control issues. The other group was informed that last year they had

⁸Copies of the research instruments are available on request from the authors.

⁹Both academic and practising auditors checked the financial statements and notes to the accounts; qualified valuers checked the valuation reports; the final document was pilot tested by four academics with auditing experience and two partners and two managers from three audit firms.

¹⁰Following the revaluations, the ratio was 62.9% whereas without any revaluations it would have been 67.6%. The research instrument did not contain any consequences of the client breaching the debt covenant.

¹¹In the final stage of pilot testing, four participants (two academics and two practitioners) received a high risk version and four received a low risk version. After they had completed the experiment, a verbal discussion was held with one of the researchers. Responses to questions concerning the different treatments confirmed the validity of the manipulation.

⁶A number of interviewees expressed concern that, in today's competitive audit environment, it is not easy to question an independent valuation. The study found that the fear of losing a client is an important one and clients sometimes impose pressures on auditors to accept a valuation.

⁷The length of the case material was 26 pages.

been involved in lengthy discussions concerning audit fees and that a rival firm, which had been providing system advice to the client, was actively pursuing the audit.¹²

Dependent Variables

The first dependent variable was an estimate of the number of hours that subjects expected the audit team to devote to the audit of each revalued asset. This estimate was made immediately after studying the background information and financial statements and before reading the valuation reports. This was considered realistic because, at the audit's planning stage, the auditor would normally be advised by the client of their intent to revalue assets and an estimate of the time to devote to this aspect of the audit would have to be made prior to receiving any valuation report. As an anchor, subjects were provided with the amount of time both planned and actually spent on the audit of the two assets in the previous year when no revaluations took place.¹³ For consistency, the actual time for both assets was slightly less than the planned time. In addition, because the investment property had been acquired during the previous financial year, more time was allocated and spent on the audit of this asset. Subjects were advised that this additional time was for non-recurring tasks such as a search of the title deeds.¹⁴ Subjects were told:

'Having examined the background information, the financial statements, extracts from the notes and additional information, you are required to estimate the number of audit hours you would expect the audit team to devote to the audit of the revalued assets. To assist you in this, last year's planned and actual hours when no revaluations took place are given.'

The second dependent variable was a judgment concerning the likelihood that subjects would ultimately accept each of the valuations as reasonable. This judgment was made immediately after reading the valuation report from the independent

valuer for each of the two assets.¹⁵ For each asset, an 11-point scale ranging from zero to 10 was provided and subjects were asked to mark a point on the scale. Only the two end points of the scale were annotated, with zero being described as 'extremely unlikely' and 10 described as 'extremely likely'. Subjects were asked:

'After considering the valuation report along with other information contained in Package One, indicate on the scale below the likelihood that you will ultimately accept the valuation as reasonable.'

Subjects

Fifty-nine audit partners and managers from the 'Big Six' audit firms took part in the experiment. The number of subjects from each firm varied from two to 15. Subjects were located in the five largest urban centres in New Zealand, with the majority from Auckland and Wellington. Because asset revaluations are generally audited by senior members of the audit team, only partners and managers took part in the experiment. Of the 59 participants, 22 were partners and 37 were managers. The average audit experience was 13 years with a minimum of four years and a maximum of 30 years. All subjects had been involved with at least some revaluations in their auditing career. Experience with investment properties was considerably less than for owner-occupied property.¹⁶

Statistical tests indicated that there were no location, firm, rank or experience effects on the dependent variables measured in the study ($p > 0.05$).

Procedures

Senior partners in the firms in each of the locations were contacted and asked to assist with the experiment. Several copies of the research instrument were delivered to the contact person who then distributed them to other partners and managers. Each instrument was in an envelope with an accompanying letter which asked the subject to open the enclosed cardboard wallet and follow the instructions on the first sheet. It was stressed that all responses would be treated confidentially and used only in a collective manner. Subjects were advised that, because there were different versions of the study, they should not discuss their responses with any other participants in their firm until after they had all completed the tasks. In some cases,

¹²Again, responses to questions asked during pilot testing confirmed the validity of the manipulation.

¹³It should also be noted that in practice an anchor is available as auditors have access to last year's budget and time records. The procedure of including an anchor is consistent with some previous research (for example, Margheim, 1986).

¹⁴The anchors were 1.5 planned and 1.2 actual hours for the owner-occupied property and 3.2 planned and 3.0 actual hours for the investment property. These hours were determined after consultation with two audit partners who had previously taken part in the structured interviews. Practitioners involved in the final pilot testing confirmed that the hours given were realistic, although two advised that a note should be included, pointing out that the difference was due to the need to search the title deeds for the investment property as it had been acquired during the previous financial year.

¹⁵The order that subjects received the two asset valuation reports was randomly varied to minimise the possibility of order effects. Statistical tests (ANOVAs including the order variable) indicated that there were no significant order effects.

¹⁶This difference is not surprising in view of the small number of property investment companies currently operating in New Zealand.

the wallets were returned to the researchers individually while, in other cases, a member of the firm collected them together and returned them in bulk.

Analysis and results

The hypotheses tested are divided into two groups based on the dependent variable being measured. Two of the hypotheses (H_1 and H_3) are concerned with the estimate of the number of audit hours that subjects would expect to devote to the audit of the revalued assets. The other two (H_2 and H_4) relate to the likelihood judgment that the valuation would ultimately be accepted as reasonable. The hypotheses are tested using analysis of variance (ANOVA). The results provided are for the owner-occupied property and reference will only be made to the investment property where the results differ from the owner-occupied property. This decision was made as the demographic data showed that subjects were significantly less experienced at the investment property task.

Estimated Audit Hours

H_1 suggests that auditors plan to spend more time on the audit of a revalued asset when the risk of breaching a financial covenant is higher and H_3 suggests that they plan to spend less time when the risk of losing the client is higher.

The results of the ANOVA are summarised in Table 1 where it can be seen that both main effects and the interaction are significant at the 0.05 level.¹⁷ The relevant descriptive statistics are summarised in Table 2. It can be seen from Table 2 that the mean estimated audit hours are greater when there is a high risk of breaching a debt covenant (3.347) than when the risk is low (2.521). Further, the means are lower when there is a high risk of losing the client (2.3) than when there is a low risk (3.56). Overall, the largest estimated audit hours occur when the risk of breaching the covenant is high and the risk of losing the client is low (4.36).

A diagrammatic representation of the results is shown in Figure 1. While Table 1 shows a significant main effect for both breach of covenant and loss of client, Figure 1 suggests that these effects are driven by the breach of covenant $\times$ loss of client interaction. The calculation of simple main effects shows that, when there is a low risk of losing the client, the breach of covenant effect is significant ($F = 6.87$, $p = 0.014$) but when the risk of losing the client is high, the breach of covenant effect is not significant ($F = 0.088$, $p = 0.77$). Similarly, the risk of losing the client effect is significant when

Table 1
Analysis of Variance for Estimated Hours for the Audit of Owner-Occupied Property

Source of variation	Sum of squares	F	Significance of F
Main effects			
Breach of covenant	10.599	6.558	0.013
Loss of client	23.950	14.817	0.000
2-way interaction:			
Breach $\times$ Loss	8.645	5.342	0.025

Table 2
Means (Standard Deviations) of Estimated Hours Assigned to the Audit of Revalued Owner-Occupied Property

Risk of losing client	Risk of breaching debt covenant		
	High	Low	Overall
High	2.333 (0.617) n = 15	2.264 (0.639) n = 14	2.300 (0.618) n = 29
Low	4.360 (2.041) n = 15	2.760 (1.193) n = 15	3.560 (1.833) n = 30
Overall	3.347 (1.805) n = 30	2.521 (0.982) n = 29	2.941 (1.506) n = 59

there is a high risk of breaching the covenant ($F = 13.547$, $p = 0.001$), but not when there is a low risk of breaching the covenant ($F = 1.904$, $p = 0.179$).

Newman-Keuls comparisons were made to further compare the differences. These tests showed that the mean of the high risk of breaching the debt covenant/low risk of losing the client group was significantly different ($p \leq 0.05$) from the other three groups. Further, there were no significant differences ($p > 0.05$) between any of the other three treatment groups. The above analysis indicates that H_1 is supported when there is a low risk of losing the client but can be rejected when such risk is high. Similarly, H_3 is supported when there is a high risk of breaching a debt covenant but can be rejected when the risk of breach is low.

Likelihood Judgment that the Valuation Will Be Accepted

Hypotheses H_2 and H_4 are concerned with the effect of the two variables on the likelihood judgments that the revaluation would ultimately be accepted as reasonable. H_2 predicts that auditors will be less likely to accept a valuation as reasonable when the risk of breaching a financial covenant

¹⁷Similar results were found for the investment property with the exception of the breach of covenant factor which is marginally significant ($p = 0.092$).

Figure 1
A Diagrammatic Representation of the Breach of
Covenant $\times$ Loss of Client Interaction Effect on
Estimated Audit Hours for the Owner-Occupied Property

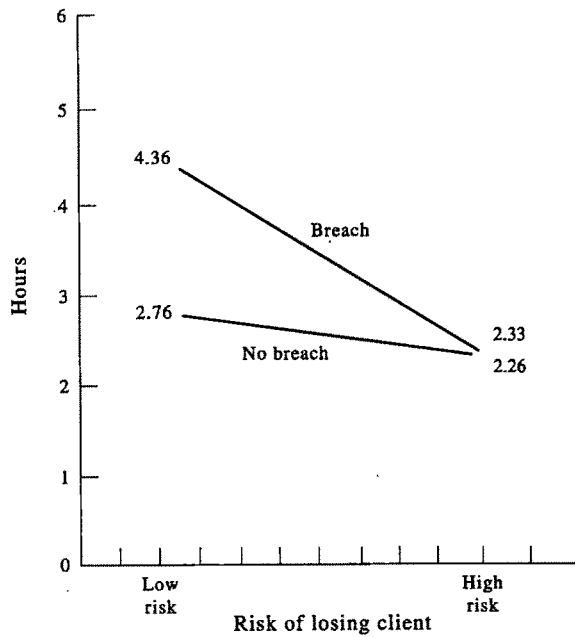


Table 3
Analysis of Variance for Likelihood Judgment that
the Valuation of Owner-Occupied Property Will
Be Accepted

Source of variation	Sum of squares	F	Significance of F
Main effects			
Breach of covenant	10.790	4.068	0.049
Loss of client	12.537	4.726	0.034
2-way interaction:			
Breach $\times$ Loss	18.849	7.106	0.010

is higher, while H_4 predicts that they will be more likely to accept a valuation as reasonable when the threat of losing the client is higher. The statistical tests undertaken to examine these hypotheses are the same as those for the estimate of audit hours.

Table 3 shows that both factors and their interaction are significant ($p \leq 0.05$).¹⁸ Descriptive statistics are summarised in Table 4. All of the means exceed the midpoint of five, suggesting that most auditors, after reading the valuation reports for each asset, anticipated that they would ultimately

Table 4
Means (Standard Deviations) of Likelihood
Judgments Assigned to the Audit of Revalued
Owner-Occupied Property

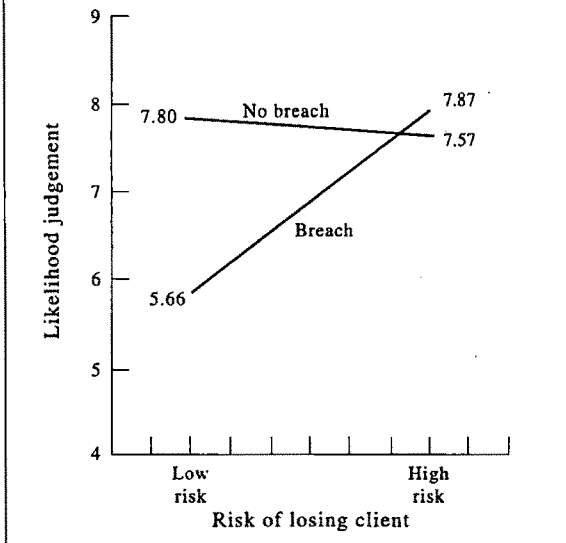
Risk of losing client	Risk of breaching debt covenant		
	High	Low	Overall
High	7.867 (1.445) n = 15	7.571 (1.412) n = 14	7.724 (1.412) n = 29
Low	5.833 (2.201) n = 15	7.800 (1.279) n = 15	6.817 (2.032) n = 30
Overall	6.850 (2.102) n = 30	7.690 (1.326) n = 29	7.263 (1.799) n = 59

accept the valuation as reasonable. The means are in the direction suggested by the hypotheses, being lower both when the risk of breaching the debt covenant is high (6.85) compared to when the risk is low (7.69), and also when the risk of losing the client is low (6.817) compared to when it is high (7.724).

A diagrammatic representation of the results is shown in Figure 2. Again, while Table 3 shows significant main effects for both breach of covenant

¹⁸For the investment property, the results for the loss of client effect and the interaction effect are only marginally significant ($p = 0.069$ and $p = 0.072$ respectively), while the breach of covenant factor was not significant ($p = 0.260$).

Figure 2
A Diagrammatic Representation of the Breach of Covenant $\times$ Loss of Client Interaction Effect on the Likelihood Judgment for the Owner-Occupied Property



and loss of client, Figure 2 suggests that these results are driven by the breach of covenant $\times$ loss of client interaction. The calculation of simple main effects shows that, when there is a low risk of losing the client, the breach of covenant effect is significant ($F = 8.952$, $p = 0.006$) but when the risk of losing the client is high, there is no significant effect ($F = 0.309$, $p = 0.583$). Similarly, when there is a high risk of breaching the covenant, the risk of losing the client effect is significant ($F = 8.945$, $p = 0.006$) but this effect is not significant when there is a low risk of breaching the covenant ($F = 0.209$, $p = 0.651$). Newman-Keuls tests showed that the means of the group given the high risk of breach of covenant/low risk of losing the client scenario were significantly different from those of all other groups ($p \leq 0.05$). There were no other significant differences between groups.¹⁹

Summary and conclusion

The purpose of this study was to identify some of the factors that affect audit decision making in the area of revalued non-current assets. An experiment was designed to investigate auditors' judgments related to asset revaluations under varying levels of the risk of losing a client and the risk of a client breach of debt covenants. In practice, these conflicting pressures do not occur in isolation and auditors must justify their judgments to different parties.

For the planned audit hours, results indicated a strong interaction between the two factors, with auditors planning to spend significantly more time on the audit of revalued assets when both the risk of breaching a debt covenant was high and there was little threat of losing the client. These results suggest that there is a certain minimum amount of work that auditors will undertake with regard to a revalued asset. However, any additional evidence collection and evaluation is influenced by the conflicting pressures placed on auditors by their evaluative audiences. Auditors are motivated to gather more evidence when the risk of breaching the debt covenant is high only when they do not run the risk of losing the client. Gaining the approval of the client when the risk of losing the client is high appears to dominate the threat of litigation. This result may reflect the fact that auditors consider that either the likelihood of litigation and/or the outcome of any legal action are dubious when they know they can claim reliance on the work of an independent expert. While this may be so, these results are of some concern as they suggest that auditors appear to be influenced by issues that could compromise their independence.

Similar results were found for the likelihood judgment that the valuation would be accepted as reasonable. Again, there is an interaction effect with auditors showing a lower likelihood judgment when there was both a high risk of breaching the covenant and a low risk of losing the client. These results suggest that, when the risk of breaching a debt covenant is low, the risk of losing the client appears to have no effect on the likelihood judgment that a valuation will be accepted. However, when the risk of breaching a covenant is high, the loss of client factor does appear to have an impact, with subjects being more likely to accept the valuation as reasonable when the risk of losing the client is higher. Further, when the risk of losing the client is high, the risk of breaching a debt covenant has no impact on the subjects' likelihood of accepting the valuation as reasonable. However, when the risk of losing the client is low, breaching a covenant does appear to have an impact on the likelihood of accepting the valuation as reasonable.

The results of this study are generally consistent with those of Farmer et al. (1987) who examined the effects of risk of litigation and risk of losing the client on auditors' acceptance of the client's treatment of a novel transaction. In that study, there also appeared to be a strong interaction effect, although this was not tested statistically. While their results appeared stronger than the results reported here, this may have been due to the within-subjects design giving rise to possible demand effects.

This research makes a number of important contributions. First, it identifies some critical factors that appear to affect audit judgments of revalued

¹⁹For the investment property, none of the comparisons was significant at the 0.05 level.

assets. Second, it extends our understanding of conflicting pressures and justification issues by highlighting a strong interaction effect when there are pressures from more than one audience. By examining the effect on estimated audit hours, we demonstrate that these pressures have an impact on the audit process as well as on decision outcomes. The results also have implications for the auditing profession because the effect of conflicting pressures on decision making may lead auditors to compromise independence.

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Post Investment Demand for Accounting Information by Venture Capitalists

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Abstract—The key concepts of principal-agent analysis are utilised to investigate influences on venture capitalists' accounting information requirements as used in their dealings with investees. The findings are based on structured interviews held with 20 leading venture capitalists, managing funds which together comprise over three quarters of all UK venture capital funds. The results confirm that a number of the key concepts of principal-agent analysis are mirrored in the financial communication process between venture capital investors and their investees. They reveal the venture capitalists' appreciation of the dangers of moral hazard and information asymmetry. It is shown that, as a consequence, their information demands are designed to provide safeguards through bonding arrangements. These establish and define an information flow which can be utilised as the basis for frequent and regular monitoring of the investee.

Introduction

This paper explores the venture capitalist's demand for accounting information. Within a principal-agent framework, it examines, through data gathered by direct interviews, the information requirements of this increasingly important specialist investor. The data provide a unique opportunity to study the methods used to meet the needs of these sophisticated users of investees' accounting information.

The focus of the paper is on the individual practices of investors in obtaining and processing information as a basis for investment decisions. It is in the tradition of research that attempts to directly investigate investor behaviour. For example, in the UK, studies by Lee and Tweedie (1981), Arnold and Moizer (1984) and Day (1986) have respectively utilised interview, questionnaire and process tracing methods to gather data on

institutional investors' perceptions of the relative importance of accounting information, the types and mechanics of the information analyses that they undertake, their comprehension of financial information and their views on how information provision could be improved. This research has, in general, confirmed the high degree of importance accorded to the financial statements provided in interim and annual shareholder reports, both as confirmation of previous estimates and as inputs to future financial forecasts.

While the above studies emphasise stock market investments, this study examines the demand for accounting information by institutional investors in a less restrictive context. It is concerned particularly with the accounting portions of the information flows to venture capitalist investors (VCIs) from their investee firms. This provides the opportunity to investigate the institutional investor's demands for information in a situation where their demand for information can directly influence supply. The VCIs can negotiate their own terms of access to financial information as part of the investment deal struck with the individual investee.¹ Information provision in itself can therefore be variable; but it can also extend considerably

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¹According to the VCI interviewees in this study, their formal rights to accounting information are enshrined in the subscription agreement which provides the legal basis of the investment relationship. While interviewees were willing to discuss the nature and implications of this subscription agreement, there was extreme reluctance to provide examples on grounds, first, of confidentiality to clients and, second, on commercial grounds because the subscription agreement is a key source of their competitive advantage. Data gathered in this study were therefore restricted to the oral information provided to the researchers in interviews.

Table 1
Total Venture Capital
Investment, 1985-1993

<i>Year</i>	<i>Value £m</i>
1985	325
1986	46
1987	1,029
1988	1,394
1989	1,647
1990	1,394
1991	989
1992	1,434
1993	1,422

Source: British Venture Capital Association (BVCA).

beyond that contained in conventional shareholder reports. In this less regulated situation, examination of the practices developed by UK VCIs in obtaining and using accounting information will provide additional and novel insights into the information needs of the institutional investor.² This paper explores the pattern of demand for accounting information by the VCI and examines how these demands may be influenced by the nature of the relationship between the two parties to the investment, viewed from a principal-agent (or simply 'agency') perspective.

It proceeds by providing background information on venture capital investment and principal-agent analysis. The sample is then considered and its relation to the population of VCIs in the UK. The results are then presented under the headings of accounting information flows, information asymmetry and moral hazard safeguards. The paper ends with a detailed discussion of results, and a brief conclusion.

Venture capital investment

Venture capital involves the provision of equity finance to firms that are typically small in size, are unquoted and provide an opportunity for 'gain through growth potential', contingent on acquiring finance to permit new investment. Normally, the

investor will expect to earn an adequate investment return within a few years through one of a variety of exit routes, such as stock market flotation, sale to a trade buyer or sale to management. While the US has been the major location for the development of venture capital, over the last decade the growth in venture capital funds in the UK has been dramatic (see Table 1). Growth of funds invested grew rapidly from £325m in 1985 to a peak of £1,647m in 1989. After a slight falling away of investment since then, it has recovered well. Indeed, in the UK, most of the leading financial institutions have created venture capital funds (cf. BVCA Handbook) and a range of autonomous organisations have also emerged. It is also interesting to note that many of the staff managing these funds have trained as professional accountants (Venture Economics, 1986). Their demands for accounting information can therefore be expected to reflect a high level of expertise. Indeed, previous studies have indicated that accounting information is a key component of any decision to commit funds (Tybjee and Bruno, 1984; MacMillan et al., 1987). It is therefore likely to be an important aspect of the ongoing assessment by VCIs of investment outcomes.

A number of researchers have shown that the post investment relations between VCIs and investees can be close and constructive with the VCI giving advice, utilising business contacts and facilitating finance, in addition to monitoring performance in a variety of ways (Gorman and Sahlman, 1989; MacMillan et al., 1989). Studies have shown that venture capitalists do vary in their interaction with investees, altering the extent of their involvement in response to their perception of the need for assistance (MacMillan et al., 1989; Sweeting, 1991).

While differences in the VCI/investee relationship and in the extent of contact between them are apparent, the reasons for these variations have not been so deeply explored. One approach to the study of external investor-investee relations that has stimulated increasing interest and provided a basis for analysing small firms has already shown promise (Eisenhardt, 1989; Sapienza, 1989) and it has recently been suggested that the VCI/investee relationship would be amenable to this type of analysis (Harrison and Mason, 1992; Mitchell et al., 1992).

Principal-agent analysis

An applied version of principal-agent analysis has been adopted to provide a framework for the investor/investee relationship in this study of accounting information used by VCIs. In a principal-agent relationship, one party (the agent) acts on behalf of another party (the principal). The agent is not fully supervised, and has a measure of

²It must, however, be borne in mind that there are significant differences in the nature of established stock market and venture capital investments. The latter will typically involve smaller firms and possibly more novel products or services. Their risk levels and the information needs of investors might therefore be considered greater. Thus, the evidence of this study may also reflect partly the impact of increased risk on the institutional investors' demand for information. However, the existence of portfolios of investments and the larger equity stakes normally held by the management team may be viewed to some extent as risk limiting factors.

independence, which he may be tempted to exploit to avoid risk and to shirk on effort. The principal therefore tries to construct a contract that will give the agent an incentive to share risk efficiently and to optimise his effort (Reid, 1987).

The use of the principal-agent model in accounting research was initiated by the likes of Baiman (1982) and consolidated in textbook treatments such as Strong and Walker (1987). Applied principal-agent analysis has been used on the client-VCI relationship by Sahlman (1990). Here, we take the analysis one step further down the tier of superior-subordinate relations, and look at the VCI's relation to the investee. Since the work of Chan, Siegel and Thakor (1990) it has been established that the VCI can be treated as a risk-neutral principal, with the investee as a risk-averse agent. Much further work has since been accomplished along these lines (e.g., Gompers and Lerner, 1994; Admati and Pfleiderer, 1994). A special interest has also emerged in explicit modelling of information and communication, especially as regards its control implications (e.g., Gordon, Loeb and Stark, 1990; and Cohen, Loeb and Stark, 1992).

Despite this flourishing of theoretical work, the empirical character of the VCI/investee relationship is still very poorly understood. This cannot be resolved by the use of secondary source data: it requires paying deliberate attention to the details of real contracting practices. The purpose of this study is to provide exactly such detail, and to explore its practical implications for risk-sharing and incentive alignment.

At the post investment stage a principal-agent (or 'agency') relationship exists between the VCI and the investee. The VCI assumes the role of principal and the investee firm's directors the role of agent. Their relationship places the principal in a position where the problem of *moral hazard* has to be addressed. The directors of the investee firm, acting in self-interest and having relinquished full ownership of the firm (perhaps subsequently retaining only a minority share), are motivated to consume perquisites ('perks') and to limit effort. They will obtain 100% of the benefit from these acts but will bear only a proportion (based on their remaining ownership stake) of their cost. The principal may therefore, through the subscription agreement or by other less formal means, attempt to establish arrangements to attenuate the effects of this moral hazard. These can take the form of *bonding* or *bond posting* whereby the principal imposes penalties on the investees if certain levels of performance are not met and establishes performance boundaries (e.g., gearing ratio standards) and decision autonomy limits (asset disposals) for the agent.

More positively, *incentives* may be provided through the reward package set for the agent (e.g., performance linked pay). Moreover, the principal

may attempt to influence the agent by *monitoring* the effectiveness of his/her performance. Performance measurement (or monitoring) will also be needed to operationalise bonding and the incentivised reward structure. For a principal such as a VCI, monitoring by direct observation of the agent's actions is impractical and therefore requires a flow of information. This is usually focused on the outcomes or results of the agent's actions.

The use of such information to assess and motivate the agent suffers from two disadvantages. First, it is difficult for a principal to identify to what extent any outcome is due to good fortune rather than the agent's effort and ability. Second, the agent possesses a greater familiarity with business operations than the principal, as well as having control over the generation of information. There is an imbalance or *asymmetry* of information. Given the pursuit of self-interest the agent may misrepresent performance or provide information selectively in order to make outcomes appear more favourable. Again, the principal may react by establishing disclosure rules and a syntax to govern the information flows.

The agency theory model is thus heavily dependent on information flows between agent and principal. Accounting, which provides financial measurements of inputs and outcomes, constitutes an integral part of this flow. It certainly is an important influence on those *ex ante* expectations that drive investment decisions. Equally, it appears logical that accounting information would be used in the *ex post* assessment of performance. In addition, it may help to limit the effects of moral hazard by providing a basis for bonding and for monitoring the agent. The problem of information asymmetry is, however, one which is not simply solved by information *per se*, but by consideration of the agent's control over the accounting systems of the firm.

This study examines how VCIs, as principals, establish and use accounting information flows from their investee firms, as agents. It does this within a principal-agent (or agency) theory framework, utilising the above concepts. It is therefore primarily concerned with monitoring behaviour. Within this context the views of these investors on moral hazard and information asymmetry are also investigated.

The sample

The study involved gathering data from 20 VCIs, adopting a methodology that has several precedents in the development of user oriented research in accounting (e.g., Day, 1986; Mitchell et al., 1989). The sample frame was given by the alphabetic listing of venture capital funds in the *Venture Capital Report* (fourth edition), which

Table 2
Main Characteristics of Sample and Population

	(1) Sample values n = 20 (Mean values with standard deviations in brackets)	(2) Population values n = 38
VCFUND (£m)	67.3 (60.2)	72.9 (93.9)
AVERG (£m)	0.98 (1.12)	0.78 (0.65)
MINEQ	6.1 (8.2)	6.3 (6.7)
MAXEQ	57.6 (19.6)	56.7 (18.2)
FREQIN	15.5 (6.1)	11.4 (2.2)
EMPLOY	26.6 (37.7)	14.0 (16.6)
TIMESCALE	5.0 (1.2)	7.9 (2.3)
NEWINV	15.4 (20.8)	10.2 (10.4)
VCEXEC	7.0 (6.2)	6.5 (4.3)
TFUNVAL (£m)	38.8 (18.6)	32.6 (17.2)

Notes:

(a) Definitions of variables

- VCFUND venture capital funds under management (£m)
 AVERG average value of investments made (£m)
 MINEQ minimum equity stake taken (%)
 MAXEQ maximum equity stake taken (%)
 FREQIN number of involvements per annum with investee
 TIMESCALE timescale for investment (in years)
 EMPLOY total number of employees
 NEWINV number of new investments made each year
 VCEXEC total number of full-time venture capital executives
 TFUNVAL total value of funds invested at valuation (£m)

(b) Sampling frame based on listing of 47 funds in Cary (1989) *Venture Capital Report: Guide to Venture Capital in the UK*, 4th edition. Sample values in column (1) are based on a random sample of 20 from this listing, with values obtained during interviews. Population values in column (2) are based on 5th edition of same work (1991), computed for 38 remaining funds from original sampling frame.

provides a comprehensive listing of active venture capital investors in the UK. A simple random sample of 20 was selected, and the selected venture capitalists were approached by pre-letter and subsequently by telephone. If it was not possible to conclude an interview, the next name on the list was selected. The original sample frame had 47 funds in it, and the sample selected, 20. Table 2 lists the main characteristics of the population and sample, giving mean values for each characteristic, with the standard deviation in brackets.

There is a general similarity between the characteristics of the sample of funds and the population

of funds. For example, venture capital funds under management are £67.3m and £72.9m in the sample and population, respectively. Further, the total value of funds invested is £38.8m and £32.6m in the sample and population respectively. There is one notable exception to this, the total number of employees. This has a high sample standard deviation (37.6) mainly because two firms had 106 and 150 employees respectively. With them excluded, the mean and standard deviations of employees in the sample are 13.8 and 9.5 respectively, which are similar to the population values. Thus while a useful feature of our sample is that it includes the

two largest players in the UK venture capital market, in a sense, being the largest, they are not typical. Subject to this caveat, the sample appears to give a good representative picture of the UK venture capital industry.

A useful device for providing a sense of what the sample is like is to present a statistical picture of the typical, average, or modal VCI in the sample. This generalises the presentation of data in Table 2. This information is based on 'basic data sheets' that VCIs were requested to complete at the time of interview. By business type VCIs were: banking (35%); independents (40%); public sector (10%); subsidiaries (10%); and investment managers (5%). Thus in the sample the typical VCI is an independent. It had no industry preference (avoiding the cynically named 'bleeding edge' of technology) and a slight geographical preference for the UK. It had been in existence for six years. About 550 proposals were received each year, of which some 165 (30%) were reviewed, leading to 15 new investment involvements (3%). Typically, it took about 15 weeks from proposal to the completion of investment.

In terms of size, the typical VCI of the sample had 27 employees and seven venture capital executives. It had about £67m funds under management, and £24m available to invest. Total funds invested at cost were £45m and at valuation £67m. The smallest and largest investments that would normally be contemplated were £0.3m and £4.1m respectively. In practice, the smallest investment made was £0.4m. The average investment size was £1m. By type of investment, the breakdown was: start-up (11%); development (45%); buyout (40%); other (4%). Thus the typical VCI involvement was in development capital provision, with the 'pure' form of VC investment accounting for 4% or less. The minimum and maximum equity stakes contemplated were 6% and 57% respectively. Typically, management/monitoring fees were charged, as were directors' fees. The desired timescale for investment was five years. By preferred exit route the breakdown was: management repurchase (5%); trade sale (47%); market listing/flotation (19%); other (28%). Thus the typical preferred exit route was a trade sale. The breakdown by type of investment was: sole (35%); lead (33%); consortium (31%). Thus, sole investment was slightly the preferred investment involvement.

In terms of monitoring, the average frequency of reporting was 15 times per year in the sample. Representation on the board had frequencies: always (35%); almost always (20%); sometimes (30%). Typically, the VCI always required representation on the board of directors. The required internal rate of return for investee involvement ('hurdle rate') was 32%. In 30% of

investment involvements the equity stake could be bought back.

These summary statistics have been provided to give the reader a background feeling for the VCIs examined below. The analysis itself is largely qualitative; and how the qualitative data were gathered is explained below.

A structured interview—concerning VCIs' use of and views on their investees' accounting information, utilising the information aspects of principal-agent theory as discussed above—was conducted with each subject. The main headings of the interview agenda were: types of information, asymmetries of information, sharing and trading information, information selection, information error, and costs of information. Interviews were conducted between June 1992 and September 1993. Two researchers were involved in each interview, one as interviewer and one as recorder. Interviews varied in duration from one and a half to two and a half hours. As well as the interview material, accounting data, financial PR, brochures, etc., were also collected. A site visit and tour were common, as was an introduction to key personnel.

The interviewees' firms accounted for over three-quarters of UK venture capital finance provision. Based on available biographies, interviewees (who were nominated by their firms) had, in general, considerable (typically 12 years) experience in the venture capital industry and often a familiarity with accounting methods (e.g., a professional accounting qualification and/or qualifications in finance, economics and business). Amongst the full-time executives of each VC fund almost inevitably there was an accountant, though s/he was not always nominated as the interviewee for the study.

Accounting information flows

Types of Information

Despite the existence of a variety of contacts and information sources in investee firms (e.g., client meetings, board membership), accounting information was a universal requirement of the VCIs. Indeed, one said that: 'We won't invest in a company unless they have a good accounting system.' Four respondents remarked on the value of receiving the annual audited accounting report, and in the main, the accounting information VCIs requested and obtained was of a fairly conventional composition. Central to the information flow were the three core financial statements: balance sheet; profit and loss account; and cash flow statement. The importance of the cash flow statement for assessing an investee's performance was particularly emphasised by over half of the interviewees.

Although these three financial statements are all a required part of the content of the annual

shareholders report, the actual form of disclosure to the VCI extended significantly beyond statutory requirements in six distinct ways:

1. The frequency of their provision was considerably increased from the statutory one of once or (in the case of interim reports) twice a year. Twelve VCIs obtained them monthly and five at least monthly. They were actively used to monitor investees' performance over these short time periods. For the most part they were, in fact, the key components of the investee firms' management accounting package, and were therefore readily available for distribution to the VCI. The other three VCIs also utilised the management accounting information of their clients but did not specify exactly the time period requirement for its provision.

2. As a part of the management accounting package these statements were expressed in a much more detailed form than those provided to shareholders. For example, the profit and loss account would disclose the components of cost of sales, identify all overheads, and possibly show profitability segmented by product line and by corporate division.

3. In one quarter of the cases it was specifically mentioned that these financial results were assessed within the context of the firm's budgeted performance. In many cases this provided a direct link to the forecasts on which investment decisions were made. Variance from budget provided an important 'attention directing' signal to the VCI.

4. In a small number of cases (two) it was indicated that all of this information had to be provided within a strict time limit from the end of the reporting period.

5. The supplementation of the financial information by a qualitative explanatory summary of performance by the management team was specified by a significant minority (six) of VCIs.

6. Further types of information were highlighted by several VCIs as being an important part of information disclosure by investees. These comprised: capacity utilisation levels (one investee); further non-financial measures of performance (one); capital expenditure analysis (two); order book position (two); and the auditors' management letter (one). Whilst important, these additions merely modify, but do not challenge, the primacy accorded to the conventional accounting reports.

Variability of Information Requirements

The degree of detail, content and frequency of information all represented sources of possible variation in the nature of information required and received by VCIs. They were specifically asked whether their information flow varied over time (longitudinally) or at a point in time (cross-

sectionally) for investees in their portfolios. Table 3 summarises their responses.

Over a third of the VCIs had fixed requirements for information provision. They did not permit variation from them for any reason. In four cases the inability of the investee to produce information up to the standard normally expected was the main way in which information flow was constrained. Such investees were typically small, start-up businesses. However, the capabilities of investees to generate a good quality of financial information did develop over time. One VCI suggested that, as investees developed their skills in information provision, information overload could become problematic, saying: 'Information varies by firm capability—sometimes it's too detailed and sophisticated.' Deviations from the expected performance levels by the investee also prompted changes in the requests for information provided. Two VCIs increased the requirement for information when the investee's performance dipped below target. They considered tighter monitoring was necessary in such circumstances. On the other hand, two VCIs reduced their information demands when performance was better than expected. Direct comments by VCIs on each of these responses to negative and positive variations were: 'Yes, there can be fundamental change if there are problems, for example, with customers or new projects', and, 'As it gets better and the more we feel comfortable, the less we want to stress them in this area.'

The maturity of investees' projects also influenced the need for information for seven of the VCIs. This was evident in two contrasting ways. Three venture capitalists accepted that less information would be available on new investees, particularly when they were small and at, or near, start-up. These VCIs appeared to appreciate that other factors might require priority. One said: 'I expect very little when they start out. I like to get the cash book balanced. Often I don't even get that and I don't press for it too much. I think it's a waste of time. They're working to build a business. As they develop, accounting information becomes more important.' The other four VCIs were of the opinion that information flows could be reduced over time as the client became established. An exception to this would be if re-financing were required, where the control aspect would be expected to be more significant once more. This aside, more information was required in the early years where investors had less familiarity with investees and there was more risk associated with the investments. However, for one of the four, the lighter information burden on more mature investees was due to a more liberal policy on information provision having been adopted when drawing up subscription agreements in previous years. A tightening of information requirements

Table 3
Information Variation

	<i>n</i> *
No variation in information provision	7 firms
Variation caused by investee's inability to provide required information	4 firms
Variation caused by changing circumstances of investee (e.g. new projects, poor performance)	4 firms
Variation by maturity of investee's projects	7 firms

Note: *Two venture capitalists indicated two influencing factors.

since then had resulted in more recent investees being required to provide more information.

Information Cost

Only two investors indicated that cost was a critical factor in influencing their information gathering activities. Both had found it impractical to access all the information that they would ideally have liked, and were prepared to compromise on cost grounds. For example, one VCI would have liked to take comprehensive soundings from all its customers on investee performance but restricted this to the 'occasional one or two'.

All the others did not consider cost to be a serious constraint on obtaining relevant information. The typical views of these VCIs are reflected in the following statements:

'... very important to get information and if it does cost more so be it. There is no greater crime than to report back "don't know".'

'... we are conscious of the cost of information but this does not deter us from getting it if we need it'.

'I'm not ever aware of having used cost as a basis for not getting information.'

Several VCIs argued that the cost of information provision was mainly borne by the investee, and in that sense was not an investor's problem. Whilst it was true that investees were required to provide the information asked of them by investors, many VCIs observed that the costs had already been borne in meeting the information demands which any normal firm would find being generated routinely by the investees' own senior management. The incremental (i.e. marginal) cost of providing the data to investors was therefore negligible.

The costs to the venture capitalist of processing the information provided by investees was only raised as an important issue by two investors. They were trying to avoid 'information overload'. If it were threatened, they required curtailment of the information supplied:

'Processing it is the problem. You can only absorb so much data and information. We occasionally shout "stop!"'

'We like to think we don't ask for information we can't process. It is important to home in on one of the key variables. We are not into information overload.'

Information asymmetry

Investee Informational Advantage

All VCIs accepted that their investees had some informational advantage over them. Indeed, several remarked that the absence of such advantage would be good reason for not investing in the managerial team concerned. In other words, part of the gain to be obtained from entering into a contract with the investee was in sharing this expertise. Investees were expected to be experts in the type of business that they ran.

The nature of the informational advantage was perceived as having different aspects to it. Central was the sectoral technical expertise and the operational knowledge of the specific firm management was inevitably assumed to possess. Their more direct exposure to the business situation and their participation in day-to-day decision-making typically imbued them with a unique knowledge of their firm's current affairs and prospects. Being positioned at the 'sharp end' ensured that they certainly obtained information on problems *before* the VCI (one respondent). Another VCI attributed the inevitability of informational advantage in part at least to the existence of a portfolio of investments which all required attention by him. The size and diversity of the portfolio precluded the development of a particularly detailed familiarity (matching that of management) with any of them.

Investors (five) held that investees may attempt to hide operational problems or delay reporting bad news, even though this information was needed by VCIs at the earliest opportunity. It was emphasised that a VCI did consider it an obligation of investees to 'put all their cards on the

table from the start', with one suggesting that 'if we suspected we weren't getting full answers we wouldn't continue the relationship'. In addition to investees hiding problems, another VCI suggested that those with a particularly good performance might mask it to allow the management team to achieve a preferable exit deal by changing backers. It is difficult to judge how serious a comment this was, as there is not yet an active secondary market in venture capital investments in the UK. Therefore it would be difficult for management to operationalise this without raising the suspicions of the existing backers.

Three factors were also cited as *limiting* the adverse effects of management's informational advantage. First, the nature of the investee's line of business could be kept simple (one respondent) with complex businesses such as biotechnology and microelectronics being excluded. In fact only four out of the 20 VCIs expressed an exclusive preference for high technology involvements. Second, the relationships established were based on trust. 'We buy integrity not information' was how one venture capitalist expressed this idea. Another said, 'We have faith in the people. If we didn't, we shouldn't have invested.' Third, a congruence in the interests of both venture capitalist and investee was considered to exist, centred on the substantial ownership of shares in the firm by both parties. Therefore the personal attachment of management to the company and the cost of perquisite consumption ('perks') would be greater than normally found in the stock market context. The investee's informational advantage was also thought to be limited by the tendency of VCIs to have development-stage and sectoral specialisations.

Selective Information

Most investors (17) considered their investees to be selective in the information they provided. The three who did not thought that their rigorous selection procedures limited adverse selection. This ensured that only those who would be 'open with us' were chosen for investment. All of the others accepted that full disclosure did not occur. One remarked that they have 'a rational motivation to misrepresent' and another that they 'give you what you want to hear'. Most (11 respondents) felt that an optimistic bias did tend to pervade reported information. In particular, aspects of poor performance, a deterioration in the market, or a decline in customer relations, were not fully communicated, and only reported when it became unavoidable.

Information Conformity with Reality

We have seen that monitoring may be hampered by the deliberate manipulation of information by the investee. It is also possible that monitoring is

handicapped by the intrinsic inability of accounting information to reflect the reality of performance. Seventeen investors considered that this was an additional problem affecting the usefulness of the accounting information provided to them by investees.

The most prominent contributory factor was the time lag with which accounting statements reflected reality. This was not merely associated with the delay in producing financial statements. Several VCIs mentioned that an accrual accounting based profit figure could indicate an apparent level of success at the time of reporting which was not matched by corresponding cash generation. Thus conflicting signals of reality were often conveyed by the information. There was also some appreciation that performance could not be properly assessed from accounts in the short run. As one VCI remarked: 'In the first two years we don't really know how the client [investee] is doing.' Others suggested that monthly information has to be accumulated in order to allow trends to become apparent.

Other less classifiable problems of matching information with reality included the following. In one case the investee's accounting information was used to translate physical product reality into financial terms. This obscured the fact that the investee's firm was not actually selling the product for which they were financed. It was also noted that errors could be made in the construction of management accounts and these could mislead investors. Moreover, accounting reports may not include vital contextual information on the market situation that may affect an investee's performance (e.g., a tripling of a competitor's capacity output).

Serious problems or 'disasters' were often not adequately represented in accounts. Indeed two VCIs noted that they had needed to 'send someone in' in these circumstances to find out what was happening. Finally, one VCI reported that accounting policy changes by an investee created an inconsistency in translating events into reported information, which had the potential to result in misleading assessments of their progress.

Moral hazard safeguards

Vetting Investees' Accounting Systems

All but one of the VCIs vetted their clients' systems. The one VCI who did not was in the process of developing a means of so doing. Seven VCIs observed that their vetting tended to be done as a one-off exercise at the time of making the investment. This was done to ensure that a reasonable information flow would be forthcoming in the post-investment period and also to ensure that management were able to control and make decisions on an informed basis. The vetting tended to cover key business systems (e.g., sales, credit

control and product costing). Where deficiencies were identified changes were required as a condition of investment. To illustrate, in one case, a VCI imposed basic cash control systems on many of his small investees.

In some cases vetting was not done directly by the investor. Five of the venture capitalists, at least on some occasions, hired firms of professional accountants to produce formal reports (incorporating recommendations for improvement) on the investees' accounting systems. A further five consulted the investees' auditors. As one VCI put it, by depending on the auditors' familiarity with financial systems he could 'get comfort that the information which is produced will be reliable and accurate'.

Investee Audit

The statutory audit of investee companies was of considerable interest to the venture capitalist. All but one VCI claimed to have an impact on the audit process. The nature of any influence exerted varied. It could be both direct and indirect. Most commonly it took the form of participating in the selection of the auditor.³ Six venture capitalists imposed their choice of audit firm, often as a condition of investment. The change to a 'large respectable' auditor (usually one of the Big Six), was what they required of the investee.

However, the VCI's influence extended beyond auditor selection in a number of ways. One venture capitalist met with the appointed auditor at an early stage to 'let them know we are investors and that we are relying on their report'.⁴ Another discussed the investee's accounting policies with the auditor, and had influenced them in one case by having the levels of provision raised to ensure 'there would be no skeletons in the cupboard to hinder improvement when recession ends'. The results of the audit were also of interest, with six of the venture capitalists monitoring the auditors' feedback through membership of the investee audit committee and by scrutiny of the management letter.

Direct Access to the Investee's Accounting System

There was an almost even split amongst the VCIs sampled on this issue. Eleven had no direct

access to their investees' accounting systems. However, several of these venture capitalists made the point that they could request any accounting information they wished, and one mentioned that he could instigate a third party investigation. Another with no direct access did use the client's auditor as a surrogate source of information. Again, the requirement to trust the investee was mentioned by one of the venture capitalists. Of the nine venture capitalists claiming direct access to investees' accounting systems, three achieved this through directorships, while one stated that such access was a condition in the subscription agreement. The others gave no specific justification for their right of access.

Discussion of results

This study prompts the following observations on the use of accounting information by institutional investors of the venture capital variety. In this investment sector the absence of stock market (and arguably 'efficient') prices for shares precludes the use of both technical and beta analysis. The investor has to rely on fundamental analysis. Fortunately, this is facilitated by the absence of stock market-like restrictions on information access. This allows VCIs to effect a more liberal expression of their information needs.

It was clear from the results of the study that accounting information is a key requirement of this type of investor. Superficially their information demands are centred on the same three financial statements as those conventionally provided to stock market shareholders. However, there was considerable evidence that their information needs extended well beyond those generated by traditional external financial accounting methods. Although conventional accounting statements remained the centrepiece of the accounting information flow, they had to be provided more *regularly* (typically monthly) and in a *more detailed form* (as per the management accounts). Moreover they usually had to be set in the context of agreed budgets and narrative explanations, and were subject to regular query. The monitoring behaviour of these sophisticated information users revealed a keenness to maintain as current a financial information flow as possible.

This greater intensity of scrutiny of investee performance was important in motivating the agent to act in accordance with the principal's objectives. It also ensured that the investor was well placed to react promptly to any deviations from plan. In the absence of a stock market the VCI is unable to effect an exit in the short term. As a result of this 'lock-in' effect, the VCI's main reaction to difficulties experienced by the investee has to be constructive. Thus VCIs can bring to bear their financing expertise, can utilise their

³This does indicate a greater than normal shareholder involvement in the appointment of the auditor. In practice, it is common for the appointment and the re-appointment of the auditor to be simply approved by shareholders at an AGM on the basis of a nomination by the company directors.

⁴The nature of the auditors' liability to shareholders has long been a contentious issue (Gwilliam, 1987). This type of behaviour could be construed as an attempt to establish a relationship which could facilitate litigation by the VCI in the event of business failure. In effect, it may be viewed as another means of confronting the problem of moral hazard.

network of business contacts and in extremis can exercise their powers to replace management.

Their main concern appeared to be to ensure losses were disclosed promptly, and that difficulties were thereby contained, rather than being allowed to intensify because they were unidentified. The avoidance of operational 'disasters' (the occasional outcome of extreme downside risk), which could seriously affect the value of the investment, appeared to be a primary concern underlying VCIs' monitoring behaviour. They were certainly keen to identify perquisite consumption ('perks') by their agents, but their perception of the main threat of moral hazard was that it lay mainly in the investee's ability to delay the disclosure of serious problems that could threaten their firm's survival. While procrastination could bring short-term benefit to the agent (e.g., in terms of continued remuneration, avoidance of loss of face and the opportunity autonomously to 'turn things round'), it did heighten the risk of ultimately experiencing a substantial loss.

The *existence* of moral hazard is a common problem across different situations. It is intrinsic to risk-sharing situations with information asymmetry. However, the *response* to moral hazard (generally governed by its severity) varies across investor-investee involvements. Among the VCIs interviewed there was little experience with start-up and early-stage investment where proactive policies are common. The emphasis rather was on development capital and buyouts. These differ mainly by adverse selection (a pre-contract problem of information asymmetry and risk classification) rather than moral hazard (with its post-contract problems of efficient risk sharing and effort elicitation). The paper gives an account of variations to be found in practice in the treatment of moral hazard problems through monitoring policies.

While the nature of the financial information flow provided by investees was generally similar, there was evidence to suggest that variations were allowed. These permitted variations to be rewards for good performance or recognition of a sound track record. In such cases a reduction in reporting frequency was permitted, although no VCI would allow information to be received at less than quarterly intervals. This pattern of behaviour indicated that for investees who were perceived by VCIs to be in a relatively low risk category, a more conventional approach to information provision was often deemed acceptable, taking the stock exchange disclosure protocol as a benchmark. This behaviour is as would be predicted for VCIs subject to moral hazard of the sort described above.

The constructive role of VCIs extended to their proactive influence in the development of management accounting systems in investee firms. For

example, they were prepared to design some of their clients' systems and would buy-in consultancy expertise to improve their investees' situation. The emphasis on budgeting and cash flow analysis reinforces VCIs' prime concern for the viability of their investees' enterprises. Their contractual involvements can therefore guarantee that no less than the basic level of information necessary for operational effectiveness is available to the investee firm's management. Indeed, this is probably one of the more beneficial consequences of venture capital involvement.

Our study shows that information asymmetry was ubiquitous in investor-investee relations in the UK venture capital industry. This was generally recognised and was considered particularly serious if it delayed the identification of deteriorating situations. These were the particular province of proactive or interventionist actions by VCIs. Even the high degree of information access accorded to VCIs did not completely remove this problem. Indeed, in some situations, it was felt that conventional accounting methods could compound the difficulties of a crisis situation because of their susceptibility to 'managerial masking' of the real, current financial position of the investee. While there was no suggestion that the comprehension of the information provided constituted a significant barrier to communication between the two parties, masking or selection of information could degrade its quality and volume.

Conclusions

The results presented above confirm that a number of the key concepts of principal-agent analysis are mirrored in the financial communication process between VCIs and their investees. They reveal VCIs' appreciation of the dangers of *moral hazard*, against which some safeguard is sought, through their *bonding* arrangements, to establish a sound supply of accounting information. This contributes to their *monitoring* of investees' performance, which is typically maintained on a regular short-term basis. A concern with *information asymmetry* is also evident in their doubts about the completeness and reliability of this information, particularly because of its managerial origins.

However, in a context in which the VCI has the power to influence information supply fairly directly, there has been no pressure applied to firms to make them diverge from conventional accounting procedures. Traditional financial statements remain at the centre of the reporting process. A marked increase in the frequency of their provision, and the incorporation of considerable management accounting detail in their construction, appear to be the main differences from the regulated accounting supply. These findings tend

to confirm the preoccupation of institutions with the short-term performance of investments. This occurs even when the option of a short-term decision to sell is not commonly available and it therefore suggests that close monitoring is indeed viewed by the VCI as a means of combating moral hazard.

Further, these findings suggest that VCIs, in their role as institutional investors who use accounting information, do not represent a radical force for change in financial reporting. This lack of desire for change in the substance of accounting procedures is probably unconnected with the perceived relevance or otherwise of information flowing to them, for user studies show that institutional investors as a class are enthusiastic users of financial statements. Thus their apparent acceptance of the status quo should simply be regarded as indicating a substantial degree of satisfaction with conventional financial statements. VCIs are certainly practised in their use, and this facility with them undoubtedly enhances the quality of investors' attempts to monitor, to the end of uncovering (and, if need be, rectifying) the consequences of moral hazard.

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An Investigation of Framing and Firm Size on the Auditor's Going Concern Decision

Priscilla O'Clock and Kevin Devine*

Abstract—This study investigated the effects of framed information and firm size on the auditor's going concern report modification decision. Framing has been shown to affect individual decision-making in a variety of contexts. Investigations of framing effects in an audit context have reported mixed results. The findings of this study indicate that auditors are susceptible to the effect of framed information. Previous research has reported that auditors from small firms may be less conservative in audit disclosure recommendations than auditors associated with larger firms. This study evaluated the going concern decisions of auditors from three firm sizes: local/regional, a large non-Big Six firm, and a Big Six audit firm. Results indicate that differences in the report issued do exist across firm size. Possible explanations for the reported results are discussed.

Introduction

When Statement on Auditing Standards (SAS) No. 59, *The Auditor's Consideration of an Entity's Ability to Continue as a Going Concern* (AICPA, 1988), was issued, the auditor's role in the going concern decision changed from a passive to an active role. This standard requires that in every audit the auditor make an evaluation of a client firm's ability to continue operations. Prior research related to the going concern decision has investigated the auditor's ability to detect going concern problems (Kida, 1980; Koh and Killough, 1990; Koh, 1991), factors auditors considered in making the going concern evaluation (Mutchler, 1984), the manner in which information is processed when making this decision (Asare, 1992), and the extent of agreement on the appropriate course of action in questionable circumstances (Campisi and Trotman, 1985; Kida, 1980; and Mutchler, 1986). Given the auditor's additional responsibilities regarding the evaluation of a client firm's ability to continue as a going concern, research that provides auditors with an awareness of factors which may bias their decision could improve the quality of the audit. The purpose of this paper is to investigate two factors that may bias the auditor's going concern decision: the effect of framed information and outcomes; and size of the audit firm.

The results of this study indicate that when uncertainty exists, auditors from local/regional

firms and a large non-Big Six firm were less likely than auditors from a Big Six firm to recommend modifying the audit report with a going concern paragraph. The auditors associated with a Big Six firm were not susceptible to a framing bias in this decision context. In addition, further insight regarding the going concern decision was obtained by evaluating the auditor's beliefs that potential positive and negative outcomes could occur as a result of this decision.

The remainder of this paper is divided into four sections. The following section summarises previous research and develops the hypotheses to be investigated. The second section includes a discussion of the research methods and a description of the subjects and the research instrument. The third section presents the results of the experiment. The paper concludes with a summary, limitations and implications for future research.

Background and development of hypotheses

The concept of framing has been an important contribution of prospect theory, which was proposed by Kahneman and Tversky (1979). Prospect theory is a descriptive model of decision-making capable of explaining the repeated violations of key axioms of popular normative decision theories such as expected utility theory (EUT), multiattribute utility theory (MAUT) and Bayesian theory. Salminen and Wallenius (1993) report support for the explanatory power of the non-linear value function model proposed by prospect theory. In their two experiments, more than 92% of the decision-maker's choice behaviour could be explained by the prospect theory model, while MAUT explained, at best, 81% and 55%, respectively.

Normative decision models typically assume that an individual's choices will be unchanged

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regardless of the decision task formulation (invariance). However, several studies (Kahneman and Tversky, 1979 and 1984; Levin, Johnson, Russo and Deldin, 1985; Tversky and Kahneman, 1986) have demonstrated that changing seemingly irrelevant cues leads subjects to violate this assumption.

Prospect theory differs from EUT in that it proposes that an editing phase occurs in the decision-making process. The function of the editing phase is to reduce the cognitive requirements in the evaluation of decision alternatives (prospects). This simplification is accomplished by reformulating prospects through several editing operations (see Kahneman and Tversky, 1979, pp. 274–75). The reformulation of prospects ultimately affects the decision frame an individual adopts. Decision frame is used by Tversky and Kahneman (1981, p. 453) to 'refer to the decision-maker's conception of the acts, outcomes, and contingencies associated with a particular choice'. The manner or context in which information is provided represents a potential source of bias which may affect the decision-maker's formulation of the problem, the decision frame adopted, and ultimately the decision reached.

In the editing process proposed by prospect theory, the decision-maker identifies a reference point and codes alternatives as gains or losses from that reference point. Research examining framing effects indicates that subtle changes in wording or presentation of a task can alter an individual's reference point, thereby affecting the decision alternative selected; for example: lives saved/lives lost, chance of failure/success. Generally, outcomes presented in negative terms are weighted more heavily than outcomes stated in a positive frame, i.e., losses loom larger than gains.

Framing effects were first identified in various abstract laboratory tasks involving gambles with money, decisions on saving lives, and product quality (Levin et al., 1985; Tversky and Kahneman, 1981). These experiments manipulated either presentation of outcome variables or attributes of the task variable to achieve the framing effect. For example, Tversky and Kahneman (1981) demonstrated that given a choice between two treatments for the outbreak of a disease, subjects would choose the risk seeking (risk averse) alternative when the outcome of the choice was framed as lives lost (lives saved). Similarly, Duchon, Dunegan and Barton (1989) found framing effects when experienced engineers made decisions regarding the allocation of funds to a research and development team. More funds were awarded by the engineers when the team's previous performance was framed in terms of percentage of successfully completed projects versus equivalent information expressed in terms of the percentage of previous projects the team did

not complete. In both of these experiments the underlying facts were identical and varied only in the manner in which they were described or framed.

Research investigating the effect of framing in an audit environment has not been as extensive as that in other disciplines. Kida (1984) possibly identified a framing effect when he noted that the amount and type of confirmatory evidence that subjects selected varied depending on whether the going concern hypothesis was stated in terms of firm failure or firm viability.

Sanders and Wong-on-Wing (1987) investigated the framing of acts, outcomes and contingencies in an audit decision context. One of their experiments consisted of positive and negative framing of information related to the prior year's warranty expense and the current year's estimated warranty liability. The authors found that auditors who received negatively framed information were more likely to assess the current year's warranty liability as inadequate when compared to subjects who received positively framed information. However, the auditors in the negative condition were not more likely to propose making an adjustment to the liability account.

Bailey, Main and Murdock (1988) investigated framing and ordering effects on auditors who were confronted with valuation of an accounts receivable balance. The study reported no ordering effects and no significant difference in the mean adjustment to the allowance account between treatment groups evaluating positively versus negatively framed information. However, the authors did report that the group of auditors receiving negatively framed information had a significantly higher variance in their adjustment to the allowance account. This finding led the authors to conclude that auditors were not immune to framing effects.

More recently, Ayers and Kaplan (1993) found that hypothesis framing affected the type of information that was used by senior auditors in explaining analytical procedure results. Specifically, the auditors were asked to choose among 18 cues that would most likely lead to a change in three key ratios used in most analytical review tests. Of the 18 cues, nine were related to factors that would indicate misstatement of the financial statements, while the other nine cues were related to non-misstatement factors. The task was framed as, (1) determine whether the financial ratio changes were due to misstatement of the financial statements; or (2) determine whether the financial ratio changes were due to other factors not related to misstatement of the financial statements. The results indicated that auditors who were presented with the task to determine whether the changes were due to misstatement of the financial statements were more dependent on cues related to misstatement of the

financial statements than the auditors that were asked to determine if the ratio changes were due to non-misstatement. The results provide evidence that hypothesis framing does affect the type of confirming evidence auditors seek and evaluate.

The results of the research discussed above indicate that the frame of information may affect decision-making. However, results of the Bailey, Main and Murdock (1988) and the Sanders and Wong-on-Wing (1987) studies indicate that framing effects may not necessarily have a significant effect on an auditor's disclosure recommendation. Previous framing research in an audit decision context has typically utilised auditors from a Big Eight firm. The present study expands earlier framing research by examining the effect of framing on auditors from firms of varying sizes.

In an attempt to determine if auditors are susceptible to the effect of framed information the following hypothesis, stated in its alternative form, is investigated:

- H1: A greater percentage of auditors receiving negatively framed information and outcomes will recommend modifying the audit report than auditors receiving positively framed information and outcomes.**

If the hypothesised framing effect is found, the effect of framing on auditors from the various size firms will be explored.

In addition to the effect of framing, this study investigates the effect of firm size on the auditor's disclosure recommendations. The effect of firm size on auditor disclosure decisions was previously investigated by Wright (1983), who advanced an economic risk rationale that proposed that small firms would be less conservative in their disclosure options. This rationale suggests that small firms suffer greater economic impact with the loss of a single client, whereas large firms are typically able to sustain the loss of a single client. In addition, large firms have economic incentives to protect their professional reputations by maintaining a conservative perspective, since damage to the firm's professional reputation could ultimately result in a large loss of revenues (Citron and Taffler, 1992; DeAngelo, 1981).

Wright's results provided evidence that auditors from small firms preferred footnote disclosure while auditors from large firms preferred adjustment in both a contingent loss and revenue recognition case. These findings supported Wright's proposition that auditors from small firms were more likely to make less conservative disclosure recommendations than auditors from large firms.

More recently, the effect of firm size on decision-making related to going concern evaluation was investigated by Citron and Taffler (1992). The authors found that auditors from small firms did not issue less conservative reports than auditors from large audit firms with respect to going concern status. Their study looked at actual decisions by both small and large firms. However, previous research has reported that small firms are believed to accept more risky clients than large audit firms (Mutchler, 1986). If the client base of small audit firms is more likely to have a going concern problem, then one would have expected a greater percentage of clients from small firms receiving the going concern modification in the Citron and Taffler (CT) study. The fact that this was not the case may, in fact, indicate that small firms are more reluctant to modify the audit report. A second possible explanation for no size difference reported in the CT study is that increased competition among audit firms has made even the large firms more reluctant to modify the audit report. Consistent with this explanation, the CT study did report a significant auditor switch rate in non-failed client firms that had received a going concern qualification.

The present study investigates whether auditors from different size audit firms, examining identical information, select different modification decisions. If the auditors from small firms make less conservative recommendations than those from large firms, this finding would provide additional support for the economic rationale forwarded by Wright.

Firm size is divided into three classifications: local/regional, large non-Big Six, and Big Six.¹ Three firm classifications were chosen in order to explore differences due to size.² Wright included all national firms as large in his study. However, the tremendous difference in revenue between a Big Six firm and the next largest firm is such that there exists a potential difference in economic risk between these two groups and therefore a third category was included in this study. Based on previously reported findings that auditors from small firms are less conservative in their disclosure recommendations than auditors from large firms,

¹Auditors from the small firms all indicated that they were from a firm with total professional staff of less than 50 professionals. The large firm auditors were from one international non-Big Six firm. The Big Six firm auditors were from one Big Six auditing firm.

²These classifications differ from those utilised by Wright (1983). Wright classified auditors who were participating in a state society programme as members of a small firm if they were employed by local and regional firms and members of a large firm if they were employed by a national firm. The proportion of those subjects that were members of the then Big Eight firms versus other large firms is not available.

the following hypothesis, stated in its alternative form, is investigated:

H2: The larger the audit firm size, the greater the percentage of auditors who will recommend going concern modification of the audit report when uncertainty exists.

This hypothesis suggests that auditors from small firms will be less likely to recommend modifying the audit report than auditors from a large non-Big Six firm. In addition, auditors from a large non-Big Six firm will be less likely to recommend modifying the audit report than auditors from a Big Six firm.

Research method

In order to test the above hypotheses, a case was given to 238 practising auditors in conjunction with state, society or firm sponsored continuing education seminars. Subjects were randomly assigned to treatment groups using a between subjects design. Subjects were eliminated from the sample if they had one or more of the following characteristics: less than two years' audit experience, sole proprietor, or partner in a firm. Finally, subjects were eliminated if they could not be classified as members of a local/regional firm, the large non-Big Six or Big Six firm studied.³ Auditors with less than two years' experience were eliminated since they would have insufficient experience to complete the task. Sole proprietors and partners were eliminated in order to develop a similar experience profile across firm sizes. In total, there were 24 auditors with less than two years' experience, 17 sole proprietors and 33 partners. All the partners were members of small local/regional firms. In addition, three subjects were eliminated because they did not belong to the firm classifications studied. A final sample of 161 usable cases was selected.

Of the remaining 161 subjects participating in this study, 47 were associated with a local or regional public accounting firm. Seventy subjects were associated with the large non-Big Six firm, and 44 subjects were associated with a Big Six firm. Eight of the auditors classified as small local/regional firm members were participating in training programmes sponsored by the large non-Big Six firm. These eight auditors were assigned to the local/regional category based on their self-reported response to a demographic question.⁴ The final

sample's experience levels ranged from two to 20 years. The median experience level of participants from local/regional firms was five years and the median position (rank) in the firm was that of supervisor. Auditors from the large non-Big Six firm had a median experience level of three years and a median rank of senior. Participants from the Big Six firm had a median experience level of three years and a median rank of supervisor.

Research Instrument

The research instrument consisted of a hypothetical case in which the auditor was asked to evaluate the going concern status of an audit client and to make a decision as to whether the audit report should be modified. Before making this decision, the subject was asked to indicate his/her belief that certain consequences, both beneficial and adverse, could result from the issue of a correct or incorrect going concern modification decision. After indicating the opinion that he/she would issue for the hypothetical client firm, the subject was asked to respond to several follow-up questions related to case realism and manipulation checks.

The case presented background information regarding an audit client and a discussion of the client firm's current situation. Background information was identical for all subjects but information regarding current status of the client was framed in a positive or negative manner.⁵

Framing Manipulation

The case materials indicated that continued bank financing was directly dependent on the client firm's ability to expand its customer base. The client firm is currently in the process of negotiating a contract with a potential new customer and the bank will continue financing conditional upon results of client-customer contract negotiations. The negative treatment group was told that there was a 30% chance that contract negotiations would fail. The positive treatment group was told that there was a 70% chance that contract negotiations would be successfully completed. The presentation of contract likelihood in terms of failure is expected to focus the auditor's perception of risk on client firm failure and lead to report modification.

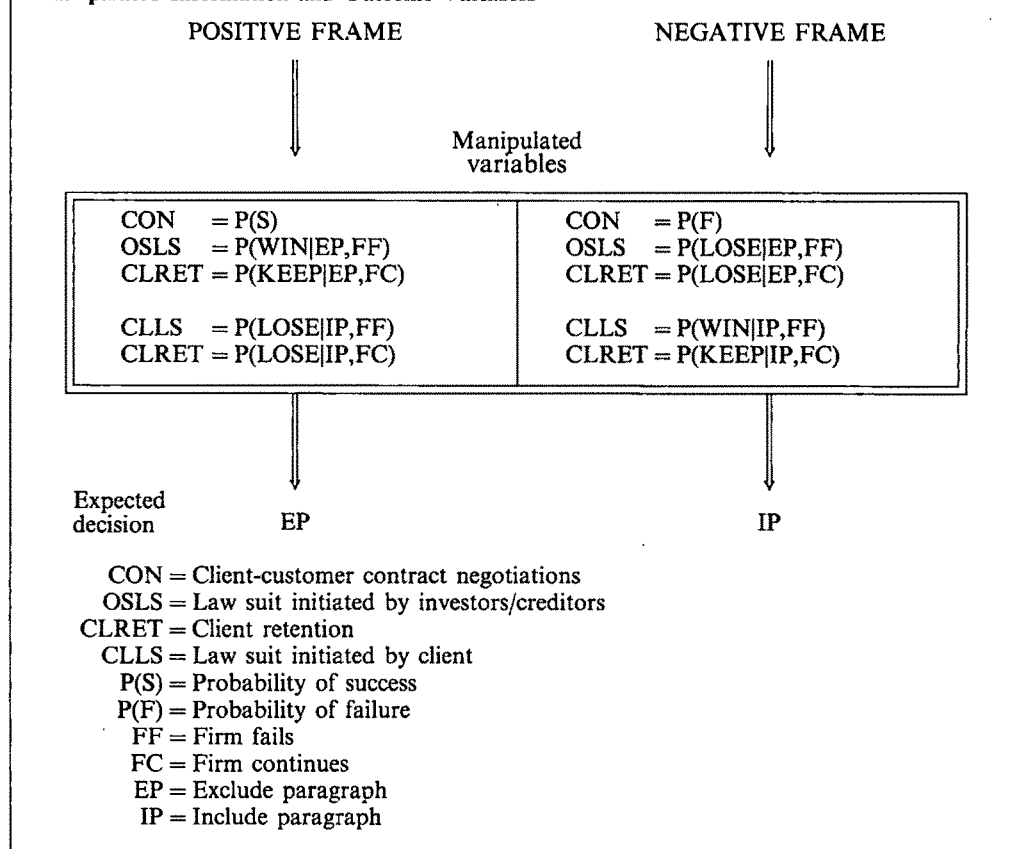
Information regarding the consequences of the auditor's going concern decision is a second potential source of the effect framing can have on decision-making in an audit environment. For example, the auditor may assess the risks such as a lawsuit initiated by creditors and investors if the audit report is not modified and the entity fails within one year beyond the date of the financial statements. Possible outcomes of including an

³The effect of this screening is noted in the results section.

⁴The large non-Big Six firm allows smaller firms to send auditors to its training sessions. A list of these individuals was made available by the firm, and the auditor's self-reported specification of firm type was used to include them in the correct population.

⁵Appendix 1 contains a summary of factors included in the case.

Figure 1
Manipulated Information and Outcome Variables



explanatory paragraph when the entity does not have a going concern problem are a disagreement with the client, loss of account, and/or possible accusation that the auditor's excessively conservative paragraph and/or disclosure, in fact, contributed to a business failure (self-fulfilling prophecy).

Consistent with the positive or negative framing of customer contract negotiations, discussed above, this study also framed, in a positive or negative manner, information related to potential consequences of the going concern decision. In this study, the probability of winning or losing litigation that may be initiated against the audit firm and the probability of keeping or losing the audit client were also framed given the actual state of nature that occurs. Specifically, positive (negative) outcome frames are defined as stating the consequence in a manner that would influence the auditor to exclude (include) an explanatory paragraph. This would be accomplished if the information frame influenced the auditor's perception of risk to the audit firm associated with a particular consequence. For example, if the auditor decides to exclude an explanatory paragraph, a potential outcome is a lawsuit against the audit firm initiated

by the client firm's investors and creditors, should the client firm fail. Presenting the outcome by stating it as a percentage chance of successfully defending such a suit is the positively framed outcome while the percentage chance of losing this suit frames the outcome negatively. Other potential outcomes are similarly manipulated by framing the probabilities in a positive or negative manner as defined above.

Figure 1 depicts the operationalisation of treatment factors and the expected effect of these manipulations. Positively framed information regarding client negotiations with a customer and positively framed outcomes are expected to result in the auditor's decision to exclude an explanatory paragraph (EP), whereas negatively framed information and outcomes are expected to influence the auditor to include a modification to the audit report (IP).

Results

The first hypothesis in this study investigated the impact of framed information on the auditor's going concern report modification decision. Hypothesis 1 was tested using logit analysis to

Table 1
Logit Results: Decision^a as the Dependent Variable with Frame and Firm Size as Independent Variables

<i>N</i>	<i>Constant</i>	<i>Frame^b</i>	<i>Size^c</i>	<i>Log-likelihood</i>	<i>Model significance</i>
161	0.734	0.668 (<i>p</i> < 0.05)	-0.523 (<i>p</i> < 0.005)	-102.12	<i>p</i> < 0.002

^aDecision: 0 = include modification paragraph; 1 = exclude modification paragraph

^bFrame: 0 = negative frame; 1 = positive frame

^cFirm size: 0 = small; 1 = large, non-Big Six; 2 = Big Six

Table 2
Proportion of Auditors Electing to Include Paragraph (PIP) Across Treatment Condition and Firm Size

<i>Firm size</i>	<i>Positive frame PIP</i>	<i>Negative frame PIP</i>	<i>z-statistic</i>	<i>Significance</i>
Local/regional (<i>n</i> = 47)	6/25 = 24%	10/22 = 45%	<i>z</i> = 1.549	<i>p</i> < 0.07
Large non-Big Six (<i>n</i> = 70)	6/33 = 18%	14/37 = 38%	<i>z</i> = 1.817	<i>p</i> < 0.04
Big Six (<i>n</i> = 44)	13/21 = 62%	15/23 = 65%	<i>z</i> = -0.228	<i>p</i> < 0.60

determine if there was a significant difference in decisions by auditors receiving positive versus negative framed information. Logit was chosen because the dependent variable was dichotomous. The results of the logit analysis are presented in Table 1.⁶ This analysis indicates that framing was significant at *p* < 0.05.

Further analysis of these results indicates that the significant effect of framing is primarily related to the decisions of auditors from the small, local/regional firms and the large non-Big Six firm, significant at *p* < 0.07 and *p* < 0.04, respectively. The decisions of auditors from each of the firm types is presented in Table 2. The analysis in Table 2 was conducted to investigate whether there were differences, across firm size, in the decisions of auditors who received framed information. Table 2 reports the results of a 2 × 2 contingency table analysis for each of the three size firms.⁷ As indicated in Table 2, in the positive treatment group only six of the 25 (24%) auditors from local/regional firms chose to include the explanatory paragraph in the audit report while in the

negative treatment condition 10 out of 22 (45%) chose the include paragraph alternative.⁸ Table 2 also reports that six of 33 (18%) auditors from the large non-Big Six firm who were in the positive treatment group chose to include the explanatory paragraph in the audit report, while in the negative treatment condition 14 of the 37 (38%) auditors from the large non-Big Six firm chose the include paragraph alternative. Finally, the results reported in Table 2 indicate that framing was not significant at *p* < 0.1 for auditors from the Big Six audit firm.

A possible explanation for the effect of framed information on the decisions of auditors from smaller firms and large non-Big Six firms could be related to training received by auditors from the various size firms. Academic research has provided evidence of potential heuristics and biases that can affect individual decision-making. As early as 1984, a publication of the Big Six firm that participated in this study discussed the effect of frame on individual decision-making. Thus, the auditors from the Big Six firms may have been alerted to the effect of this bias through firm education programmes.

A second possibility for the effect of framing on auditors from non-Big Six firms may be audit firm structure. Structured firms tend to rely on formal rules and procedures for integrating audit test results, whereas unstructured firms tend to leave

⁶The model was also tested with experience (measured both as position in the firm and years of audit experience) as an independent variable. Neither variable was significant, there was no significant interaction, and in no case was the model significantly improved.

⁷Conover (1980, p. 146) suggests the use of a 2 × 2 contingency table. This utilises the standard normal distribution in making decisions to accept or reject hypotheses regarding equivalent population percentages when using a one-tail test. Thus, the null hypothesis will be rejected when the calculated *z* is greater than the standard normal distribution value at the desired significance level.

⁸If partners from the small firms were included in the sample, the proportion choosing to modify in the positive frame is 7/41 (17%) and in the negative frame 18/36 (50%), *z* = 3.07 (*p* < 0.01). However, there was no experience effect in the small firms with or without the partner group.

more considerations to the judgment of the field auditor (Kinney, 1986). A structured audit environment that focuses auditor attention on guidelines and policies, or the use of decision aids, may result in auditors from more structured firms being less susceptible to decision bias. Kinney (1986) provided evidence that small firms tend to employ unstructured audit technologies. The large non-Big Six firm in this study was previously classified as unstructured while the Big Six firm was classified as structured. However, the results of previous research regarding the effect of audit structure on auditor decision-making is not consistent (Morris and Nichols, 1988; Bamber and Snowball, 1988; Mutchler and Williams, 1990). In addition, this research has relied on the firm classifications reported by Cushing and Loebbecke (1986) and Kinney (1986). These classifications may have changed, given the extent of firm mergers and advances in audit technology over the past eight years.

Hypothesis 2 asserted that auditors from smaller firms would be less conservative in a going concern report modification decision than auditors from larger firms. To test this hypothesis, logit analysis was used to determine whether there was a significant effect of firm size on the decision to modify the audit report. Table 1 presents the results of this analysis. The results suggest that there is a significant difference in audit decisions across firm size with the size variable significant at $p < 0.005$.

To determine if the differences were in the direction hypothesised, 2×2 contingency tables were constructed to assess whether there was a significantly smaller proportion of auditors from the local/regional firms selecting modification of the audit report when compared with both the non-Big Six and Big Six firms. In addition, the decisions of auditors from the non-Big Six firm were also compared with those of auditors from the Big Six firm.

The results reported in Table 3 indicate that there was not a significant difference in decisions selected by the local/regional practitioners when compared with decisions of the auditors from the large non-Big Six firm ($z = -0.628$, $p < 0.27$). However, the results indicate that there was a significant difference between local/regional firms and the Big Six firm ($z = 2.823$, $p < 0.01$). The

results in Table 3 also indicate that the decisions of auditors from the large non-Big Six firm were significantly different from those in the Big Six firm ($z = 3.692$, $p < 0.001$). Auditors from both the local/regional firms and the large non-Big Six firm were less likely to recommend modifying the audit report when uncertainty exists.

The findings reported above cannot be directly compared to those of Wright (1983). Wright's results indicated that disclosure recommendations of auditors from small firms were less conservative than those of auditors from large national firms, however, it is not possible to determine the proportion of auditors in Wright's sample that were from Big Eight firms. The present study investigated two sizes of large firms because of the tremendous difference in firm revenues between the Big Six and other national/international audit firms. The results above indicate that auditors from the small firms were less conservative than those from a Big Six firm but not less conservative than auditors from a large non-Big Six firm. In addition, the auditors from the large non-Big Six firm were less conservative than those from the Big Six firm.

Wright's economic rationale may continue to explain the differences in decision-making, as reported above. The high number of mergers and business failures has created increased competition for audit clients. This increased competition may affect all but the largest of firms and may provide an economic incentive for all but the largest of firms to issue a less conservative audit opinion. A second possible reason for the results reported in this study is that auditors from the large non-Big Six firm may have different risk preferences than Big Six auditors. Previous research has reported that auditors do consider risk to the audit firm when making a going concern decision (Mutchler, 1984). Potential consequences of an incorrect reporting decision, such as effect on the firm's professional reputation or threat of a lawsuit, may be weighted more heavily by Big Six auditors than other large firm auditors. A higher tolerance for level of risk could explain the less conservative decisions of the participants from the large non-Big Six firm.

Potential reasons for this difference in the modification decision across firm size was investigated by analysing the auditor's strength of belief

Table 3
Comparison of the Proportion of Auditors Electing to Include Paragraph (PIP) Across Firm Size

<i>Local/regional PIP</i>	<i>Large non-Big Six PIP</i>	<i>Big Six PIP</i>	<i>z-statistic</i>	<i>Significance</i>
16/47 = 34%	20/70 = 29%		$z = -0.628$	$p < 0.27$
16/47 = 34%		28/44 = 64%	$z = 2.823$	$p < 0.01$
	20/70 = 29%	28/44 = 64%	$z = 3.692$	$p < 0.001$

Table 4^a
Comparisons Across Firm Size of Mean Beliefs of Auditors Regarding Going Concern Decision Outcomes

<i>Outcomes</i>	<i>Mean belief response</i>			
	<i>Small firm</i>	<i>Big 6 firm</i>	<i>Non-Big 6</i>	<i>Big 6 firm</i>
1. Exclude paragraph/client has problems				
• Cause lawsuit against audit firm by client's creditors and investors	5.53	6.09*	5.51	6.09**
• Provide grounds for alleging audit negligence			5.66	6.18*
• Negative effect on audit firm's reputation in the business community	5.19	6.05**		
2. Include paragraph/client has problems				
• Alert creditors and investors to client's problems thereby increasing credibility in public's eyes			5.73	6.25**
• Fulfil audit firm's responsibility to the public	6.13	6.57*		
3. Exclude paragraph/client does not have problems				
• Increase credibility of audit report in the eyes of the public			3.86	4.64*
• Avoid deteriorated relations with the client			5.03	5.80**
• Avoid undue alarm and concern by the client's creditors, suppliers and customers	5.32	6.00*		

^aAuditors' responses were anchored by: (1) strongly disagree; and (7) strongly agree.

* $p < 0.1$. ** $p < 0.05$.

that consequences, listed in Appendix 2, could result from this decision. There were no significant differences in beliefs of auditors from small firms when compared with those of auditors from the large non-Big Six firm. This finding is consistent with the results reported above; there was no significant difference in the going concern decision between these two groups.

The beliefs of auditors from the Big Six firm differed from those of the auditors from either the small firms or the large non-Big Six firm. Table 4 presents a summary of the outcomes on which these groups had significantly different mean belief measures. The Big Six auditors reported a higher mean belief that, when the client has a going concern problem, issuing an audit report without an explanatory paragraph could result in the following consequences: a lawsuit against the audit firm initiated by the client's investors and creditors; grounds for audit negligence; and a negative effect on the audit firm's professional reputation. When the client has a going concern problem, this group of auditors also reflected a higher mean belief that including the modification paragraph would alert creditors and investors to the problem and would fulfil the accounting firm's responsibility to the public. If the client does not have a continuity problem and an audit report is issued without modification, the auditors from the Big Six firm indicated a higher mean belief that this would result in increased credibility of the audit report, avoid deteriorated relations with the client, and undue concern to the client's investors and creditors.

The significant difference in beliefs between auditors from the Big Six firm and auditors from the large non-Big Six and small firms regarding potential outcomes of this decision provides a possible explanation for the significant difference in the report modification decision as reported in this study. The beliefs of auditors from the Big Six firm seemed to indicate a more conservative disclosure perspective with respect to a going concern modification and indicated a propensity toward including the explanatory paragraph when uncertainty exists.

Conclusions

This paper reports the results of a study that investigated the effect of framed information and audit firm size on auditors' going concern report modification decisions. Auditors evaluate information from a variety of sources both internal and external to the firm. This information may be intentionally or inadvertently framed in a positive or negative manner. The expectation was that auditors who evaluated negatively versus positively framed information would be more likely to recommend modifying the audit report. This study may be differentiated from prior framing research in an audit context in that this study included auditors from three different sized firms. In addition, based on Wright's economic rationale model, this study investigated the effect of firm size on decision-making in this audit context. It was hypothesised that when uncertainty exists regarding going concern status, the larger the audit firm

of the subject the more likely the auditor would recommend modifying the report.

Before discussing the results of this study, certain limitations will be noted. First, this study is subject to the same limitations that are generally common to laboratory studies, such as lack of accountability and potential lack of relevant information that would be present in a real audit environment. Second, a variety of factors, such as economic incentives, nature of the task, risk tolerance, proportion of Securities and Exchange Commission clients in audit client base, the importance to the auditor of maintaining a perception of quality, fear of litigation, and experience level, potentially influence the auditor's decision in this study and the effect of framed information on the decision. Since the sample population that was analysed included auditors of approximately equivalent experience level, this study also lacks random selection from the population of auditors, another common limitation in laboratory studies.

On experience limitation, the subjects that participated were all experienced auditors who should have been familiar with the task of interest given the changes in auditor responsibility with respect to going concern evaluation. The participants were, however, not at an experience level or position with the firm likely to be responsible for the final decision regarding report modification, but would be in a position to make a recommendation—the role they assumed in this study. Thus, the results of this study may not be readily generalised to an actual audit engagement.

One of the primary findings of this study was that auditors are susceptible to framed information. The framing effect was further investigated across auditors from different firm sizes. Framing effects were not significant among the Big Six participants. One possible explanation for this finding is that auditors associated with the Big Six firms may have been alerted to potential framing biases through their training programmes. An awareness of a framing effect should lead to implementation of strategies, procedures and training to mitigate this potential flaw in the audit decision-making process.

Differences were also investigated in going concern report modification decisions across the three firm sizes represented. This study's results indicate that auditors from both local/regional firms and a large non-Big Six firm were less likely to modify the audit report than auditors from a Big Six firm. This finding may indicate that auditors from Big Six firms have different tolerance levels and preferences for risk due to factors such as type of client, nature of services provided, and concern over the firm's professional reputation. One of the potential consequences of modifying the audit report is loss of the client. Increased competition may have created a situation in which only the largest firms

are economically positioned to sustain this loss. The loss of any one client may not have a significant impact on the Big Six firms and thus these auditors may be more willing to issue an audit report with a modification paragraph, regardless of this potential consequence.

The results do indicate that auditors from the Big Six firm have significantly different perceptions of the consequences associated with a going concern decision. Specifically, auditors from the Big Six firm appear to be more sensitive to potential negative effects on the firm's reputation. Future research should examine differences in auditors' attitudes and perception of consequences when comparing decisions of auditors from different size firms.

Generalisation of the results of this research may be limited to the auditor's going concern modification decision. Future research should consider other audit decision contexts. In addition, a potential alternative explanation for the results presented in this study is that audit structure may have affected auditors' decisions. Research extensions should also attempt to measure firm structure. Perhaps a task specific measure of structure should be considered since firms may be structured around some audit tasks and not others.

Appendix 1

Summary of Key Facts in the Decision Case

A. *Industry Factors*

1. Medium size manufacturing firm.
2. Mature stable industry.
3. Low growth rate.

B. *Client Background*

1. Audit client for previous 10 years.
2. Unqualified opinion in all prior years.
3. Longstanding relationship with bank.
4. Prior to two years ago:
 - a) Stable market share;
 - b) Operating and liquidity ratios within industry norms;
 - c) Stable labour force;
 - d) Competent management team;
 - e) Regular dividend distributions;
 - f) Good quality product;
 - g) Standard trade credit terms from suppliers;
 - h) No problems with collections on receivables;
 - i) Limited service area.
5. Most recent two years:
 - a) Two years ago a major customer was lost through merger;
 - b) Two years of operating losses reported but positive cash flow;
 - c) Operating and liquidity ratios have declined relative to industry norms;

- d) Client efforts to expand customer base have been unsuccessful;
- e) No technical or financial resources to expand product line.

C. Current Situation

1. Client is dependent on external financing.
2. Bank will refinance debt only if provided evidence of return to profitable operations.
3. Client is negotiating three-year contract with potential new customer.
4. Client will return to profitable position if new customer is acquired.
5. Client management estimates a 30% chance that negotiations will fail or a 70% chance that they will be successful.
6. Auditor concurs with management estimates after review of source documents regarding negotiations.
7. Client is not currently in violation of loan covenants.
8. Client will not be able to meet debt requirement in next 12 months.
9. Search for alternative financing has been unsuccessful.
10. If financing is not secured, client must sell assets central to operations.
11. Legal counsel indicates no litigation is pending.
12. Client objects to going concern modification in audit opinion.

- b) Result in issuing the appropriate audit report;
- c) Fulfil audit firm's responsibility to the public;
- d) Contribute to the client's problems;
- e) Result in deteriorated relations with the client.

3. Exclude paragraph/client does not have problems:

- a) Avoid unfavourable publicity to audit firm;
- b) Increase credibility of audit report in public's eyes;
- c) Avoid deteriorated relations with the client;
- d) Reinforce accounting firm's competency in public's eyes;
- e) Avoid undue alarm and concern by the client's creditors, suppliers and customers.

4. Include paragraph/client does not have problems:

- a) Loss of client;
- b) Lawsuit by client against audit firm;
- c) Negative effect on audit firm's reputation in the business community;
- d) Deteriorated relations with client;
- e) Cause client to have going concern problems.

Appendix 2

Decision Outcomes Ranked by Auditors⁹

1. Exclude paragraph/client has problems:
 - a) Cause lawsuit by client's creditors and investors against audit firm;
 - b) Provide grounds for alleging audit negligence;
 - c) Negative effect on audit firm's reputation in the business community;
 - d) Result in not fulfilling accountant's responsibility to the public;
 - e) Would allow the client more time to work out problem.
2. Include paragraph/client has problems:
 - a) Alert creditors and investors to client's problems thereby increasing credibility in public's eyes;

⁹Auditors' responses were anchored by (1) strongly disagree and (7) strongly agree. Anova was used to determine significance across firm size and differences were reported for those consequences that were significant at the 0.05 and 0.1 significance level after using the Scheffe adjustment procedure for multiple comparisons.

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An Empirical Evaluation of an Induced Theory of Financial Ratios

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Abstract—The recent paper of Tippett (1990) explores some analytical properties of accounting ratios on the assumption that the underlying financial aggregates are generated by some form of diffusion process. The present paper uses a long time series of four accounting ratios, taken from the Cambridge/DTI database of the accounts of UK listed companies, to assess whether the models advanced in this paper can be sustained at an empirical level. Of the models tested, only the Logarithmic Random Walk and the Elastic Random Walk seem to be consistent with the data. Even here, however, there is some evidence that the constant variance (homoscedasticity) assumption may not be satisfied and there is also a suggestion that the normality assumption might not be satisfied by the Elastic Random Walk models. Nonetheless, these models perform as well, if not better, than any of the models previously examined in the literature.

Introduction

Ratios have for many years been used by accountants and financial analysts as a practical means of summarising and analysing financial data (Horrigan, 1968). In recent years, however, a substantial academic literature has emerged in the field of accounting ratios. Following the pioneering empirical study of Horrigan (1965), there have been theoretical analyses of the properties of accounting ratios by Lev and Sunder (1979) and Whittington (1980), and numerous statistical studies of their distributional properties, some of which were surveyed by Barnes (1987).

A recent paper by Tippett (1990) proposes a model of how such ratios might develop through time. The basic assumption is that all relevant financial aggregates can be modelled as diffusion processes.¹ Ratios are then viewed as induced measures whose analytical and statistical properties can be derived by applying standard techniques from the realm of stochastic calculus. Tippett (1990) pays particular attention to two processes; namely, the Geometric Brownian Motion and the Elastic Random Walk.

In the Geometric Brownian Motion model, the logarithms of the financial aggregates from which the ratio is constructed are assumed to evolve as pure random walks. The Elastic Random Walk model also assumes that the ratio evolves as a random walk but with a tendency for the numerator and the denominator to revert to some normal or mean value. Since, for both models, the statistical distribution of the ratio is determined by the interaction of the numerator and denominator, the variance of the ratio will tend to grow with time. This is in contrast with the view, common in the literature, that the variance of an accounting ratio will remain constant through time.

The present paper reports the results of tests using Tippett's models and data derived from the accounts of large listed companies for the period from 1948 to 1985. Section two of the paper reviews the diffusion based approaches outlined in Tippett (1990) and which form the basis of the empirical work reported in the present paper, and relates them to the intertemporal asset allocation models first proposed by Merton (1969, 1971 and 1973). This section also proposes an extension of the Elastic Random Walk model. The third section describes the data used in the empirical study, and the fourth presents and reviews the empirical results. The fifth section summarises our main conclusions and suggests some possible directions for future research.

Financial ratios and the theory of the firm

Previous empirical studies of accounting ratios, such as those covered in Barnes's (1987) survey, have concentrated on testing how accounting ratios are distributed, rather than on the nature of the process that might be responsible for generating such distributions. Tippett (1990) has

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¹A diffusion process is a Markov process which involves continuous changes of state. In the present context this implies that changes in financial aggregates are 'small' and serially independent. Cox and Miller (1965, p. 203) and Crank (1975, p. 1) provide particularly readable introductions to this area, including several examples.

addressed the latter question by proposing some stochastic processes that might give rise to the observed distributions, and this paper is concerned with the empirical testing of the descriptive validity of these processes. However, it might reasonably be suggested that this is still an essentially atheoretical approach, describing the process (whereas the earlier literature described the distribution) rather than being derived from the underlying economic motivation which might explain the process. We therefore offer two alternative, but complementary, characterisations of how certain stochastic processes might be predicted from economic theories of the firm.

First, we can use Merton's (1969, 1971 and 1973) characterisation of the firm as holding both risky and non-risky assets, with the return dynamics of the risky assets being described by a Geometric Brownian Motion. If it is assumed that asset returns, variances and covariances are stationary in time, we can then show that the firm will continuously rebalance its asset portfolio so that the ratio of its investments in any two assets will be constant through time.² Rebalancing, however, is a costly exercise and, in any event, is not always completely within the firm's control (Ball, Lev and Watts, 1976, pp. 8–9). Hence, it is more likely that the continuous time rebalancing model represents an 'ideal' towards which the firm will periodically 'target' its investment policy (Bliss, 1923; Boulding, 1950; Friedman, 1956; Lev, 1969; Peles and Schneller, 1989; Davis and Peles, 1992). Within such a framework, balance sheet ratios will describe the optimal proportionate investments firms will attempt to achieve by periodically rebalancing their asset portfolios in response to variations in their capital base.

Second, the behavioural theory of the firm provides a broader justification for the belief that ratios, or their component variables, will tend towards some normal value, as in the Elastic Random Walk (Cyert and March, 1963). In this approach, the normal value will be a behavioural rule of thumb, which need not be the same as the optimising value implied by the Merton model. The behavioural model has been used to justify the use of firm-specific norms in a study of liquidity variables (Whittington, 1971, chapter 9). This approach could be used to justify a much wider class of models of the evolution of financial ratios than is studied in the present paper, such as more general mean reversion models than those implied by the Elastic Random Walk of Tippet (1990) (Whittington, 1971, chapter 4). However, this approach too implies that the firm's investment

policy will be described by some form of periodic 'targeting' process.

Tippet (1990, pp. 79–81) shows that targeting processes like these can be modelled as a first order Elastic Random Walk and, in discrete time, will take the following form:

$$\log \left[\frac{x_j(t + \Delta t)}{x_j(t)} \right] = \alpha_j + \beta \log[x_j(t)] + \mu_j t + \epsilon_j(t) \quad (1)$$

where $x_j(t)$ is the amount invested in the j th asset at time t , α_j and μ_j are constants and $\beta = -(1 - e^{-\lambda \Delta t})$ where λ is the speed of adjustment coefficient which, for pragmatic reasons, is assumed to be the same for all assets. Finally, the stochastic error term, $\epsilon_j(t)$, is an independent and identically distributed normal variate. Now the logarithm of the ratio of the amount invested in the j th and k th assets is

$$\log[r_{jk}(t)] = \log \left[\frac{x_j(t)}{x_k(t)} \right] = \log[x_j(t)] - \log[x_k(t)].$$

This, taken in conjunction with previous analysis, implies that for the first order Elastic Random Walk or targeting process, the ratio's evolution may be described by the equation:³

$$\log \left[\frac{r_{jk}(t + \Delta t)}{r_{jk}(t)} \right] = \alpha_{jk} + \beta \log[r_{jk}(t)] + \mu_{jk} t + \epsilon_{jk}(t) \quad (2)$$

where $\alpha_{jk} = \alpha_j - \alpha_k$, $\mu_{jk} = \mu_j - \mu_k$ and $\epsilon_{jk}(t) = \epsilon_j(t) - \epsilon_k(t)$. Tippet (1990, p. 81) shows that $\epsilon_{jk}(t)$ will be an independent and identically distributed normal variate and this in turn implies that the Ordinary Least Squares Regression (OLS) procedures will provide efficient parameter estimates (Johnston, 1984, p. 32). Furthermore, setting $\beta = 0 = \mu_{jk}$ implies that the ratio is generated by a Geometric Brownian Motion or equivalently, a Logarithmic Random Walk, so that the latter process is nested within the above model (Tippet, 1990, pp. 77–79).

Sample details

The data for this study are drawn from the Cambridge/DTI database of the accounts of UK listed companies (Meeks, Wheeler and

²We are indebted to our colleague, Mr. Huw Rhys, who developed this proof in conjunction with one of the authors. A copy of the proof is available on request.

³Here it is important to note that we are not attempting to cast the evolution of financial ratios into a theoretical strait-jacket based on first order stochastic differential equations. A more general theory of higher order stochastic differential equations does in fact exist, and the methods outlined in Tippet (1990) and Rhys and Tippet (1993) are special cases of it. This more general approach leads to a flexible system of autoregressive processes which could be used to develop a much more sophisticated theory of time series variations in financial ratios. Unfortunately, this more general approach involves considerable increase in complexity and so it seems sensible to first assess the extent to which the simple methods outlined here are consistent with the empirical evidence.

Whittington, 1991). In order to obtain a continuous set of time series observations for each company, the sample consists of those companies which remained in the database continuously from 1948 to 1985 inclusive. These companies all fulfilled three criteria during the period:

- they were listed on a UK stock exchange;
- they were primarily engaged in manufacturing or distribution in the UK; and
- they met certain size criteria.⁴

In all, 122 companies met the continuity condition, but four were eliminated because of negative observations in the data, something we expand on below.

The continuity requirement is essential in order to obtain a comparable time series for each company, but it does introduce the possibility of survival bias. Those companies that continued in independent existence avoided liquidation and takeover during the period. This suggests that they may have enjoyed a more stable environment or better management than the average. Both of these may favour the assumptions of the Elastic Random Walk rather than the Geometric Brownian Motion, and this possible sampling bias may be reinforced by the fact that restrictions on the minimum size of companies included in the database mean that the companies studied are selected from the larger listed companies. However, in the absence of data relating to companies excluded from our sample, suggestions concerning the possible direction of survival bias and the large company effect, are purely speculative.

For each company, four ratios were calculated for each year, the year itself being described by the variable $t = 1$ for 1948 and $t = 38$ for 1985. The four ratios were:

$$(1) \text{ Liquidity} = \frac{\text{Cash; marketable securities; and tax reserve certificates}}{\text{Current liabilities}}$$

$$(2) \text{ Current assets} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

$$(3) \text{ Stocks} = \frac{\text{Stocks and work in progress}}{\text{Current liabilities}}$$

$$(4) \text{ Liability ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

The ratios were selected to conform with one of the requirements of the random walk models specified above; namely, that they cannot assume negative values. They have also been the subject of regular empirical testing and analysis in the

literature, thus providing a further perspective for the present study (Deakin, 1976, p. 91).

As previously noted, four companies had to be excluded because the third ratio was negative in certain years: this problem arose because progress payments are deducted from stocks, and these can be very large in certain industries that have a long period of production (e.g. shipbuilding). Hence, our final population, used in subsequent regression analyses, consists of 118 listed companies, each of which has 38 annual observations (from 1948 to 1985) on each of four ratios.

Empirical analysis

Regression Models

Our empirical analysis encompassed three basic regression models. The first and most general is given by the Elastic Random Walk model of equation (2). This assumes that changes in the ratio are a function both of time and of the ratio's current value. We henceforth refer to this as the *time-dependent* model. The second model suppresses time dependency and for that reason is referred to as the *time-independent* model.⁵ This model constrains μ_{jk} to be zero in equation (2) and was tested on the grounds that it is more consistent with our elaboration in the second section of this paper of the Tippet (1990) analysis. The third model is a test of whether ratios are generated by a Geometric Brownian Motion or equivalently, a Logarithmic Random Walk, and assumes that both μ_{jk} and β are zero in equation (2), with α_{jk} being interpreted as the drift parameter (Cox and Miller, 1965, pp. 207–208; Tippet, 1990, pp. 80–81).

The results from the time dependent and time independent Elastic Random Walk regression models are summarised in Tables 1 and 2 respectively. Hence, the first panel of Table 1 contains the time dependent regression results relating to the liquidity ratio, the second panel contains results relating to the current asset ratio and so on. The first entry in the first row of each panel contains the average $\bar{R}^2$ and the second entry contains the highest value obtained for the $\bar{R}^2$ statistic, both across all 118 regressions; the third entry contains the upper quartile or the $(118/4 \approx 30)$ th highest

⁴The criteria varied during the period. They are described briefly in Meeks, Wheeler and Whittington (1991) and in more detail in the other sources to which this introductory paper refers.

⁵Nelson and Kang (1984, p. 78) investigate '... the consequences of estimating [a regression] relationship in levels when the differenced relationship is the one with stationary disturbances'. Amongst other things they show that OLS estimation procedures will then be inefficient and $\bar{R}^2$ overstated. They also note (p. 81) that 'Regression models involving non-stationary time series should be estimated in difference form and the results carefully compared with those for the regression in levels with time as an explanatory variable.' Tippet's (1990) paper comes to similar conclusions in the context of the time series analysis of financial ratios. However, following Nelson and Kang we allow for the possibility of technological innovation by including time as a regressor in a first differenced version of Tippet's (1990, p. 81) basic regression equation.

Table 1
Time-dependent Elastic Random Walk

$$\log \frac{r(t + \Delta t)}{r(t)} = \alpha + \beta \log[r(t)] + \mu t + \epsilon(t)$$

	Mean	Highest	Upper quartile	Median	Lower quartile	Lowest
Liquidity ratio						
R-squared (adj)	0.2017*	0.5782*	0.2633*	0.2030*	0.1336*	0.0028
β	-0.4679	-0.0758	-0.3402	-0.4798	-0.5800	-0.9265
$t(\beta)$	-3.0861*	-0.8333	-2.3380*	-2.9520*	-3.6990*	-5.7450*
$\hat{\mu}$	-0.0100	0.0488	0.0041	-0.0093	-0.0229	-0.0601
$t(\hat{\mu})$	-0.8234	3.1400*	0.3738	-1.0385	-2.0290*	-4.5700*
$\hat{\alpha}$	-0.5142	0.6949	-0.0819	-0.3678	-0.9220	-2.5440
$t(\hat{\alpha})$	-1.3471	3.1610*	-0.4521	-1.7410	-2.5140*	-4.5140*
Durbin-Watson	1.8773	2.3353	2.0062	1.8747	1.7582	1.0910*
Breusch-Pagan	4.3145*	18.4010*	6.1250*	3.9725*	1.5760	0.0240
Jarque-Bera	18.5953*	348.2870*	10.7221*	2.4914	0.9006	0.0033
Chow	1.5510	5.9673*	2.2891	1.2724	0.6798	0.0199*
Current ratio						
R-squared (adj)	0.1822*	0.4926*	0.2345*	0.1734*	0.1111*	-0.0065
β	-0.4171	-0.0548	-0.2805	-0.3990	-0.5336	-0.9063
$t(\beta)$	-3.0589*	-0.4710	-2.4020*	-2.8935*	-3.7520*	-6.2690*
$\hat{\mu}$	-0.0083	0.0120	-0.0045	-0.0076	-0.0117	-0.0360
$t(\hat{\mu})$	-2.1959*	4.2340*	-1.3940	-2.3300*	-2.9540*	-7.6850*
$\hat{\alpha}$	0.4179	1.8458	0.5510	0.4078	0.2362	-0.3619
$t(\hat{\alpha})$	2.6550*	7.0170*	3.3540*	2.6175*	1.9350	-4.4090*
Durbin-Watson	1.8620	2.4941	1.9919	1.8675	1.7190	1.0695*
Breusch-Pagan	3.2548	22.3320*	4.8510*	2.2610	0.9540	0.0350
Jarque-Bera	9.7071*	153.4120*	6.4200*	2.4052	0.9463	0.0171
Chow	1.7858	6.3399*	2.5316	1.3544	0.7995	0.1048*
Stocks ratio						
R-squared (adj)	0.1747*	0.4644*	0.2258*	0.1628*	0.1054*	0.0076
β	-0.3932	-0.0845	-0.2554	-0.3673	-0.4969	-0.8830
$t(\beta)$	-3.0950*	-0.8711	-2.3550*	-3.0865*	-3.5780*	-6.7400*
$\hat{\mu}$	-0.0097	0.0114	-0.0051	-0.0082	-0.0123	-0.0462
$t(\hat{\mu})$	-2.2044*	2.3500*	-1.6120	-2.3585*	-3.0920*	-6.3040*
$\hat{\alpha}$	0.0799	1.3245	0.1969	0.0774	-0.0395	-0.5878
$t(\hat{\alpha})$	0.8386	6.0340*	2.2780*	1.2850	-0.5601	-3.3180*
Durbin-Watson	1.9033	2.5643	2.0686	1.8792	1.7497	1.4418
Breusch-Pagan	3.0849	10.4950*	5.1390*	2.0285	1.3110	0.0230
Jarque-Bera	12.4787*	249.8970*	4.3385	1.5430	0.7549	0.0286
Chow	1.7209	9.9117*	2.3071	1.4212	0.6677	0.0939*
Liability ratio						
R-squared (adj)	0.1303*	0.3896*	0.2061*	0.1192*	0.0627*	-0.0211
β	-0.3139	0.1402	-0.1973	-0.2992	0.4121	-0.8168
$t(\beta)$	-2.5063*	1.5520	-1.8620	-2.3450*	-3.1280*	-5.1640*
$\hat{\mu}$	0.0053	0.0367	0.0076	0.0050	0.0019	-0.0100
$t(\hat{\mu})$	1.5433	3.9130*	2.3150*	1.8455	0.9415	-2.8620*
$\hat{\alpha}$	-0.3887	0.0170	-0.2225	-0.3467	-0.4804	-2.0324
$t(\hat{\alpha})$	-2.3755*	0.2493	-1.7150	-2.2460*	-2.9940*	-5.1660*
Durbin-Watson	1.8563	2.6567*	2.0455	1.8611	1.6790	1.0644*
Breusch-Pagan	3.8431*	23.2190*	5.0460*	2.9340	1.5640	0.0410
Jarque-Bera	17.4092*	209.9530*	16.5216*	3.4564	1.0692	0.0365
Chow	2.3690	13.2850*	2.9855*	1.8747	0.9560	0.0499*

*Significant at 0.05 level

Table 2
Time-independent Elastic Random Walk

$$\log \frac{r(t + \Delta t)}{r(t)} = \alpha + \beta \log[r(t)] + \epsilon(t)$$

	<i>Mean</i>	<i>Highest</i>	<i>Upper quartile</i>	<i>Median</i>	<i>Lower quartile</i>	<i>Lowest</i>
Liquidity ratio						
R-squared (adj)	0.1474*	0.5171*	0.2253*	0.1404*	0.0710	-0.0261
β	-0.3245	0.0240	-0.1954	-0.3075	-0.4646	-0.7679
$t(\beta)$	-2.4773*	0.6117	-1.8660	-2.3885*	-3.0090*	-5.4950*
$\hat{\alpha}$	-0.5281	0.0431	-0.2014	-0.4083	-0.7804	-1.7435
$t(\hat{\alpha})$	-2.4485*	0.5730	-1.8290	-2.4855*	-3.1260*	-5.0000*
Durbin-Watson	1.9728	2.5017	2.1759	1.9923	1.7754	1.1060*
Breusch-Pagan	2.1370	14.3220*	3.9280*	1.0735	0.2510	0.0010
Jarque-Bera	17.6997*	511.0850*	9.0936*	2.8277	0.8359	0.0081
Chow	2.0571	8.5484*	3.0441	1.6168	0.6491	0.0109*
Current ratio						
R-squared (adj)	0.0649	0.3044*	0.1049*	0.0463	0.0121	-0.0281
β	-0.1835	0.0146	-0.0856	-0.1552	-0.2587	-0.6729
$t(\beta)$	-1.8188	0.1059	-1.2280	-1.7390	-2.4300*	-5.5330*
$\hat{\alpha}$	0.0967	0.6023	0.1195	0.0722	0.0238	-0.0747
$t(\hat{\alpha})$	1.2941	5.3680*	2.0720*	1.2960	0.6028	-1.8270
Durbin-Watson	2.0001	2.6864*	2.2305	1.9748	1.8103	1.3262*
Breusch-Pagan	1.7342	22.0810*	2.2980	0.7045	0.1740	0.0000
Jarque-Bera	11.7189*	181.0240*	9.9294*	2.7468	0.8436	0.0437
Chow	3.1616	14.5910*	4.4781*	3.0007	1.3345	0.0062*
Stocks ratio						
R-squared (adj)	0.0586	0.3633*	0.1176*	0.0353	-0.0076	-0.0286
β	-0.1749	0.0466	-0.0562	-0.1245	-0.2754	-0.7553
$t(\beta)$	-1.6605	0.9213	-0.9099	-1.4640	-2.2990*	-6.3520*
$\hat{\alpha}$	-0.0655	0.2690	-0.0202	-0.0468	-0.0884	-0.5000
$t(\hat{\alpha})$	-1.1748	2.7050*	-0.6293	-1.3475	-1.8130	-4.7090*
Durbin-Watson	2.0218	2.6856*	2.1759	1.9769	1.8355	1.4169*
Breusch-Pagan	1.4299	8.7740*	1.9160	1.0385	0.2380	0.0010
Jarque-Bera	13.6312*	213.8190*	7.4906*	2.1245	0.9184	0.0120
Chow	2.9427	10.3120*	4.0556*	2.6650	1.3337	0.0629*
Liability ratio						
R-squared (adj)	0.0548	0.3499*	0.0893*	0.0289	0.0055	-0.0279
β	-0.1521	0.0059	-0.0636	-0.1120	-0.2133	-0.4800
$t(\beta)$	-1.6508	0.1545	-1.0630	-1.5305	-2.1730*	-4.3310*
$\hat{\alpha}$	-0.1272	0.0319	-0.0444	-0.0886	-0.1958	-0.5410
$t(\hat{\alpha})$	-1.4936	0.7747	-0.8510	-1.3370	-2.1320*	-4.0700*
Durbin-Watson	1.9569	2.7139*	2.1657	1.9605	1.7474	1.0909*
Breusch-Pagan	2.2834	23.1810*	3.2900	1.1435	0.1530	0.0000
Jarque-Bera	21.4855*	373.8790*	23.1142*	5.0763	1.6249	0.0396
Chow	2.9866	21.4890*	4.0436*	2.1968	1.0182	0.0103*

*Significant at 0.05 level

value obtained for the $\bar{R}^2$ statistic, the fourth entry contains the median or 59th highest value; the fifth entry contains the lower quartile value while the last entry is the lowest value obtained for the $\bar{R}^2$ statistic. The second row contains similar data for the estimated regression parameter, $\hat{\beta}$; the third row contains information relating to the t -statistic associated with $\hat{\beta}$; the fourth row contains information relating to the estimated regression parameter, $\hat{\mu}$; and the fifth row contains information relating to the t -statistic associated with $\hat{\mu}$. The fifth and sixth rows contain similar information relating to the regression parameter $\hat{\alpha}$. The last four rows contain information relating to the Durbin-Watson test for first order autocorrelation,⁶ the Breusch-Pagan test of heteroscedasticity in the residuals, the Jarque-Bera (1980) test for normality of the regression residuals and the Chow test for inter-temporal stability of the regression parameters.

Of the two models, the time-dependent model seems to be the better specification for the current, stocks and liability ratios. The time-dependent model for the current asset ratio, for example, has all three median regression t -statistics significant at any reasonable level; while for the stocks and liability ratios, two of the three median regression t -statistics are significant. A crucial test of the relative performance of the two models is the statistical significance of $\hat{\mu}$, the coefficient on time, in the first model. The median and mean t -values on this coefficient are significant at the 5% level for two of the ratios (current ratio and stocks), and for the other two ratios the quartile values are significant. This suggests that, if the t -values are reliable, we should accept the time-dependent model. This is supported by generally higher $\bar{R}^2$ values for the time dependent model. Furthermore, the median Durbin-Watson statistics, which vary from 1.8611 for the liability ratio to 1.8792 for the stocks ratio, indicate that autocorrelation is not

much of a problem, a conclusion that was also supported by the alternative Durbin h -test.⁷

Finally, the Chow test statistic for changing regression parameter values (which is derived by splitting the sample into two and applying regression results from the first sub-sample to the second sub-sample) are consistent with the hypothesis that the regression parameters are stable over time (Johnston, 1984, pp. 507–508). For the time-dependent regression model, the test statistic is distributed as an F variate with $v_1 = 3$ and $v_2 = 31$ degrees of freedom.⁸ For the current, stocks and liquidity ratios, both the median and average test statistics are not significant at any reasonable level, thus indicating that there is little likelihood of our regressions being affected by parameter instability.

There are, however, two areas of potential concern with the time-dependent regression model. The first of these relates to the magnitude of the Breusch-Pagan heteroscedasticity test statistics which, in this instance, are asymptotically distributed as chi-square variates with one degree of freedom. Note that whilst none of the median test statistics are significant at generally accepted levels, they are nonetheless somewhat higher than the theoretical median of 0.455 for the chi-square distribution with one degree of freedom.⁹ Similarly, the average statistics across all 118 corporations are somewhat higher than their expected values of unity. Indeed, in the case of the liability ratio and the liquidity ratio, the average Breusch-Pagan statistic is significant at the 5% level, as is the median statistic in the case of the liquidity ratio. These considerations indicate that there might be a problem with heteroscedasticity.¹⁰ This, in turn, means that the t -statistics may be biased upwards and may therefore provide unreliable tests of the statistical significance of the regression coefficients.

A second area of potential concern relates to the Jarque-Bera (1980) Lagrange Multiplier test for normality of the regression residuals. Here the test statistic is based on a weighted sum of squared skewness and kurtosis measures and, under the null hypothesis that the regression residuals are normally distributed, is asymptotically distributed as a chi-square variate with two degrees of freedom. The time-dependent model returns average test statistics which are significant at any reason-

⁶Our models involve use of a lagged dependent variable and so the traditionally reported Durbin-Watson statistic is likely to have reduced power and be biased towards 2, its expected value in the absence of first order serial correlation (Johnston, 1984, pp. 318–321). Durbin (1970) suggests an alternative 'h' test based on the sampling variance of the lagged dependent variable and the original Durbin-Watson test statistic. However, this is an *asymptotic* result and Kenkel (1974 and 1975) shows that for small samples the Durbin test does not in general outperform the Durbin-Watson test. Given this, it perhaps should come as no surprise that when we applied Durbin's h -test to our data, there were no important differences between it and the results reported in the text for the better known Durbin-Watson statistic. The results for Durbin's h are not reported in Tables 1 and 2 because the Durbin-Watson test gives comparability with the Table 3 results (in which there is no lagged dependent variable) and it is available for all companies, whereas in a small proportion of cases, Durbin's h could not be computed. See Johnston (1984, p. 318) for further discussion of this issue.

⁷See footnote 6 above.

⁸For details of how the degrees of freedom are calculated, see Kennedy (1992, p. 108).

⁹This (and subsequent) figures for the chi-square distribution were obtained from Pearson and Hartley (1976, Table 7, pp. 128–135).

¹⁰If heteroscedasticity does exist, it could be due to the omission of higher order lagged dependent variables. This suggests that a useful area for future research is the development and empirical testing of the more general theory of stochastic differential equations alluded to in footnote 3.

able level. Against this the median test statistics, although somewhat higher than the theoretical value of 1.386 for the chi-square distribution with two degrees of freedom, are not significant for both models across all four ratios. This suggests that a few large 'outliers' might be unduly inflating the averages, although eliminating them does not seem to reduce the averages enough for us to be confident about the normality assumption. It should be noted that the upper quartile value for the chi-square distribution with two degrees of freedom is 2.773 and all four ratios have upper quartile values far in excess of this. Hence, for the time dependent model, the normality assumption must remain an open issue.

Turning to Table 2, the liquidity ratio is the only instance in which the *time-independent* model seems to perform at all comparably with the *time-dependent* model. For this ratio, the time-dependent model has only one of its three regressors returning median *t*-statistics which are statistically significant at the 5% level. In addition, there is evidence of heteroscedasticity in the residual term, since both the median and average Breusch-Pagan statistics are significant at the 5% level. Thus, the *t*-statistics will tend to be biased upwards.

The *time-independent* model, on the other hand, returns statistically significant median *t*-statistics for both of its regressors. Furthermore, heteroscedasticity does not seem to be much of a problem since both the median and average Breusch-Pagan statistics fall well below generally accepted significance levels. Both the average and median Durbin-Watson statistics exhibit little evidence of autocorrelation, a result which is also supported by Durbin's *h*-test.¹¹

Finally, the Chow test for changing regression parameter values, which in this instance is distributed as an *F* variate with $v_1 = 2$ and $v_2 = 33$ degrees of freedom, returns test statistics which are not significant at any reasonable level. This indicates that for the time-independent liquidity model there is little likelihood of the regressions being affected by parameter instability.

The one note of caution for the time-independent liquidity ratio regression model relates to the magnitude of the Jarque-Bera test statistics for normality of the residuals. Here, the average test statistics are significant at any reasonable level. Even eliminating what might loosely be referred to as 'outliers' is of little assistance to the normality cause, since at 9.0936, the test statistic's upper quartile value is also significant at the 1% point level. Hence, for this model too, the normality assumption must remain an open issue.

The time-independent model (Table 2) performs less well than the time-dependent model (Table 1) for the other three ratios. This is not surprising because, for these three ratios, the crucial coefficient on time, $\hat{\mu}$ was, as already noted, statistically significant in a high proportion of cases. It does, however, seem that heteroscedasticity is generally less of a problem for the time-independent model.

The final model tested was the Geometric Brownian Motion or Logarithmic Random Walk. It will be recalled that this involves setting $\mu_{jk} = 0 = \beta$ in equation (2) so that α_{jk} is the drift parameter. We have already seen (Tables 1 and 2) that we cannot accept the hypothesis that μ and β are zero, but our tests were limited by possible statistical bias, so that it is worth testing the Geometric Brownian Motion model directly. The results are given in Table 3. The standard R^2 measure is not applicable to this model because it does not involve the estimation of a slope coefficient. Note that for all four ratios both the average and median *t*-statistics associated with α are not significantly different from zero at any reasonable level.

This is consistent with the hypothesis that in logarithmic form, the ratios follow a pure random walk; that is, the ratio tends to fluctuate randomly around an expected value which is constant through time (Cox and Miller, 1965, p. 22).

The standard Breusch-Pagan test of heteroscedasticity also could not be applied to this model and so we have used the Goldfield-Quandt test in its place (Johnston, 1984, pp. 300-301). The Goldfield-Quandt test divides the sample into two sub-samples and estimates the standard error of the residuals for each sample. A standard *F*-test for equality of variance across the two sub-samples is then applied. In the present instance, dividing the sample into two time periods produces an *F*-statistic with $v_1 = 18$ and $v_2 = 19$ degrees of freedom.¹² For all four ratios the average *F*-statistics are either significant or close to being significant at the 5% level. There is some evidence, however, that the averages are affected by the presence of 'outliers', because the median *F*-statistics are not significant for any of the four ratios. Nonetheless, the upper quartile values for all four ratios remain significant at the 5% level and so doubt must remain about the stability of the variance through time. Against this, both the average and median Durbin-Watson statistics indicate that serial correlation is not much of a problem for the model.

The Jarque-Bera test for normality of the regression residuals also could not be applied to this model and so it was replaced with the chi-square goodness of fit test. Details of the test are

¹¹See footnote 6 above.

¹²For details of how the degrees of freedom are calculated, see Johnston (1984, p. 301).

Table 3
Logarithmic Model

$$\log \left[\frac{r(t + \Delta t)}{r(t)} \right] = \alpha + \epsilon(t)$$

	Mean	Highest	Upper quartile	Median	Lower quartile	Lowest
Liquidity ratio						
$\hat{\alpha}$	-0.0246	0.1045	0.0007	-0.0283	-0.0530	-0.1271
$t(\hat{\alpha})$	-0.3213	0.9577	0.1142	-0.3871	-0.7188	-2.0070*
Durbin-Watson	2.2617	2.7982*	2.5178	2.2823	2.0743	1.1603*
Goldfield-Quandt	3.3267*	64.6170*	3.3123*	1.5745	0.6760	0.1219
Chi-Sq Good Fit	5.1890	16.1233*	7.5782*	4.6753	2.3553	0.2903
Chow	0.3736	4.2637*	0.4671	0.1563	0.0444	0.0001*
Current ratio						
$\hat{\alpha}$	-0.0168	0.0254	-0.0088	-0.0170	-0.0237	-0.0575
$t(\hat{\alpha})$	-0.6407	1.1140	-0.3586	-0.6311	-0.9549	-1.8120
Durbin-Watson	2.1907	2.9958*	2.4469	2.1231	1.9645	1.4106*
Goldfield-Quandt	2.8865*	24.9490*	3.2375*	1.4667	0.8190	0.2280
Chi-Sq Good Fit	4.7243	18.4904*	6.3112	3.7541	2.2150	0.1005
Chow	0.5317	6.4893*	0.5992	0.1977	0.0383*	0.0000*
Stocks ratio						
$\hat{\alpha}$	-0.0201	-0.0236	-0.0113	-0.0183	-0.0271	-0.1256
$t(\hat{\alpha})$	-0.6315	0.9473	-0.3969	-0.5968	-1.0180	-1.8620
Durbin-Watson	2.2086	2.9493*	2.4780	2.1609	1.9743	1.4463
Goldfield-Quandt	2.1210	18.6190*	2.4598*	1.3181	0.7514	0.1360
Chi-Sq Good Fit	4.8028	15.4511*	6.3995	4.1543	2.0747	0.2903
Chow	0.5592	8.2778*	0.6911	0.2298	0.0611	0.0000*
Liability ratio						
$\hat{\alpha}$	0.0132	0.0431	0.0214	0.0121	0.0062	-0.0201
$t(\hat{\alpha})$	0.6071	1.9670	1.0530	0.5544	0.3009	-1.5230
Durbin-Watson	2.0952	2.7531*	2.3467	2.1198	1.8843	1.1136*
Goldfield-Quandt	3.1213*	44.4070*	3.8118*	2.0142	0.8256	0.1092
Chi-Sq Good Fit	5.7975	21.0305*	8.0182*	4.9952	2.6225	0.2903
Chow	0.6483	3.9796	0.9396	0.3145	0.0745	0.0001*

*Significant at 0.05 level

to be found in Conover (1980, pp. 190-191). Under the null hypothesis that the ratio is normally distributed, the test statistic is distributed as a chi-square variate with three degrees of freedom. For all four ratios both the average and median test statistics are not significant at any reasonable level, and so we can maintain the hypothesis that the ratios are normally distributed.

For this model the Chow test for inter-temporal stability of the drift parameter, α , is based on an F -statistic with $v_1 = 1$ and $v_2 = 35$ degrees of freedom. However, since both the median and average Chow statistics are much less than unity, it is more appropriate to base our testing procedures on the statistic $1/F$ which is also distributed as an F variate but with $v_1 = 35$ and $v_2 = 1$ degrees of freedom (Freund and Walpole, 1987, p. 297). Applying this test shows that for all four ratios,

neither the average nor the median F -statistics are significant at any reasonable level. This, in turn, supports the hypothesis that α is a stable parameter. Thus, the logarithmic random walk model with zero drift has a reasonable degree of descriptive validity, apart from the heteroscedasticity problem, although it appears to be dominated by the more sophisticated Elastic Random Walk models.

Duration of the Adjustment Process

The empirical results reported in the previous sub-section indicate that the Elastic Random Walk provides a reasonable description of the generating process for financial ratios. They also shed light on the vexed issue of the duration of the adjustment process for financial ratios (Peles and Schneller, 1989; Davis and Peles, 1992). From equation (2),

Table 4
Duration of the Adjustment Period for Financial Ratios

Ratio	β	Std error (β)	λ	0.500	0.900	0.950	0.990
Liquidity	-0.3075	0.1101	-0.3674	1.8864	6.2664	8.1528	12.5329
Current	-0.3990	0.1717	-0.5092	1.3614	4.5223	5.8837	9.0446
Stocks	-0.3673	0.1265	-0.4578	1.5142	5.0301	6.5443	10.0603
Liability	-0.2992	0.1250	-0.3555	1.9496	6.4764	8.4260	12.9529

it will be recalled that the 'speed of adjustment' coefficient, λ , where $\beta = (e^{-\lambda \Delta t} - 1)$, is an absolute measure of the intensity with which proportionate changes occur in the ratio as a result of the stochastic 'shocks' that drive it away from its expected value. Large values of λ imply that the ratio is quickly adjusted towards its expected value; small values imply that the adjustment process is slower.

Using the techniques outlined in Tippet (1990, pp. 79-80), it may be shown that for the Elastic Random Walk the difference between a ratio's expected value and its observed value is an exponentially weighted average of past stochastic shocks. The exponential nature of the adjustment process means that there is no finite period during which a shock's influence will be completely eliminated; its impact certainly decays, but never completely vanishes. However, it is possible to determine the time necessary for the impact of a past shock to decline by a specified fraction of its initial value. The fraction $\frac{1}{2}$ is usually chosen for convenience, in which case we compute what has come to be known as the shock's 'half-life' (Apostol, 1967, p. 313). To illustrate the procedures involved, from Table 2 the liquidity ratio returns a median OLS estimate of $\beta = (e^{-\lambda \Delta t} - 1) = -0.3075$ with a standard error of 0.1101. Solving this equation produces the median estimate of the speed of adjustment coefficient, or $\lambda = 0.3670$. The median half-life of the adjustment process is obtained by solving the equation $e^{-\lambda t} = \frac{1}{2}$, which for the liquidity ratio, reduces to $t = 1.8864$ years.¹³ In other words, it takes just under two years for about half the effect of a random shock to be removed from the ratio.

Given the present context, however, there is nothing special about the half-life of the adjustment process; indeed, more interest will probably attach to the period required for shocks to be

'almost completely' eliminated. Table 4 contains further information on this issue for the four ratios examined in the paper. The estimated median half-lives for the current, stocks and liability ratios are computed in conjunction with the time-dependent median estimates of β obtained from Table 1. The remainder of the Table contains the standard error of β and the median estimates for 90%, 95% and 99% of a shock's influence to be removed from the ratio. Hence, the median estimate for the time necessary to eliminate 95% of a shock's influence is 8.1528 years for the liquidity ratio, 5.8837 years for the current ratio, 6.5443 years for the stocks ratio and 8.426 years for the liability ratio. The other figures contained in the Table are similarly interpreted. The estimates contained in Table 4 are broadly consistent with the estimates obtained by Peles and Schneller (1989) and Davis and Peles (1992), albeit on a different set of ratios.

The relative estimated duration periods reported here may also be of some significance. They suggest that the ratio with the shortest duration, namely the current ratio, is top priority for 'correction', which is what we might expect, since it is an obvious 'headline' measure of liquidity (Foster, 1986, pp. 61-62). The next in line is stocks, which, according to management accounting texts, are subject to fairly tight control (Drury, 1992, pp. 671-685). The other ratios may reflect preferences as to financial pattern (gearing etc.) rather than constraints.

Summary and conclusions

The present paper applies models justified by the continuous time methods investigated by Tippet (1990) to a long time series of financial ratios taken from the Cambridge/DTI database of the accounts of UK listed companies. Two models, namely the Elastic Random Walk and the Logarithmic Random Walk, seem to be reasonably consistent with the data. The latter, the Logarithmic Random Walk, is nested within the former (Elastic Random Walk) and it is the Elastic Random Walk that seems to offer the more powerful characterisation of the empirical evolution of financial ratios. However, there is evidence for both models that

¹³Using t tables and the standard error, it follows that the 95% 'confidence interval' for β is $[-0.3075 - 2.03 \cdot 0.1101, -0.3075 + 2.03 \cdot 0.1101] = [-0.5310, -0.0840]$. This implies that $0.92 \leq t \leq 7.9$ years is the 95% confidence interval for the half life. The size of this and the other confidence intervals implied by the standard errors, means that the results reported in Table 4 must be interpreted with caution. We are indebted to an anonymous referee for bringing this to our attention.

the constant variance (homoscedasticity) assumption may not be satisfied and it is also doubtful whether, in logarithmic form, any of the ratios are normally distributed. Nonetheless, these models perform as well, if not better, than any of the models previously suggested in the literature.

The Elastic Random Walk models outlined here and in Tippett (1990), are equivalent to the well known first order autoregressive (AR) processes (Chatfield, 1984, pp. 44–50). Hence, a natural generalisation, and one that could lead to more satisfactory, but certainly more complicated, models assumes that ratios are generated by 'higher' order or n th degree stochastic differential equations (Hoel, Port and Stone, 1972, pp. 159–170). The discrete time generalisation of this assumption is that ratios are generated by n th order AR processes. In other contexts, the literature contains evidence suggesting that such models hold considerable potential for the time series modelling of financial ratios (Board and Walker, 1990, p. 188).

The potential application of AR models is suggestive of another line of investigation. As previously noted, in logarithmic form the ratio of two financial variables has the representation

$$\log[r_{jk}(t)] = \log \left[\frac{x_j(t)}{x_k(t)} \right] = \log[x_j(t)] - \log[x_k(t)].$$

Intuition suggests that $\log[x_j(t)]$ and $\log[x_k(t)]$ '... cannot drift too far apart...' (Engle and Granger, 1987, p. 253). These are the conditions required for the application of co-integration techniques; indeed, consistent with earlier suggestions the Granger Representation Theorem asserts that it should be possible to model financial ratios by some form of Autoregressive Integrated Moving Average or ARIMA process (Engle and Granger, 1987, pp. 255–256). Such a process would be consistent with the theories of the firm discussed in the second section of this paper.

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Acting Editor: Keith Houghton

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THE COST OF CAPITAL OF A COMPANY UNDER AN IMPUTATION TAX SYSTEM

R. R. Officer

THE INFORMATION CONTENT OF ASX SUSPENSION THREAT ANNOUNCEMENTS

Stuart J. Laing and David R. Woodliff

PREDICTIVE POWER OF THE TERM STRUCTURE IN AUSTRALIA IN THE LATE 1980'S: A NOTE

Richard Heaney

AN EMPIRICAL INVESTIGATION OF THE AUDIT EXPECTATION GAP: AUSTRALIAN EVIDENCE

Gary S. Monroe and David R. Woodliff

AUDITOR INDEPENDENCE, AUDIT QUALIFICATIONS AND THE PROVISION OF NON-AUDIT SERVICES: A NOTE

Graeme Wines

BOOK REVIEWS

Book Reviews

The Regulation of Financial Reporting in the Nordic Countries. *J. Flower (ed.)*. Publica, 1994. 285 pp. Fax: (46) 820 5021.

This book is an output of the Centre for Research in European Accounting (CREA) that was set up in 1991. The idea behind CREA is that since accounting problems are often international by nature, issues should be addressed by teams composed of researchers from several countries. A further aim of CREA is that the organisation should act as an intermediary between European universities and the European Union with the aim of producing research findings that will influence policy decisions.

The purpose of this book is to provide timely information on the Nordic region (Denmark, Finland, Iceland, Norway and Sweden) in the light of a decision in 1992 to join the European Economic Area. The aim is to provide information on financial reporting regulation that will assist the process of harmonisation of company accounts. The structure of the book is to have separate sections on each country in the region with an engine up front in the form of an introductory chapter and an engine at the back with a summary and conclusions section.

The introductory section covers the harmonisation of company accounts in the European Community (EC) and discusses a model of the system for the regulation of financial reporting. Quite reasonably, the editor believes that the main reason why the EC intervenes in the field of company accounts is because of Gresham's law of accounting: poor financial reporting drives out good financial reporting. If the EC did not intervene, member states may compete with each other (as was done in the US some 100 years ago) to have the most liberal regulatory environment with a 'real danger of a competitive collapse of the whole system of financial reporting'.

The format for each country section is very similar and is as follows: the background to financial reporting; history; rule-making bodies; analysis; specific instance of rules; references; and appendices.

In 1962, the Nordic Council aimed to improve harmonisation with a view to establishing a Nordic common market. As part of this aim it was considered important to prepare common accounting and legal rules. However, Denmark's membership of the EC in 1973 curtailed moves in this direction.

Denmark was the first country to implement the Fourth EC Directive and one effect was to introduce the concept of 'true and fair' instead of 'good accounting practice'. The view of the author of this chapter is that the differences between the old and new general clause are of academic interest (presumably in the irrelevance sense!). This is because the Company Law Panel and the auditing profession considered the clauses to be identical. In practice, the new concept has only been used in a few cases as an explanation for departing from the law.

Of more significance as far as accounting in Denmark has been concerned, has been the change in which tax law valuations and specific tax bookkeeping techniques had to be eliminated from the financial statements. After many years of confusion, the Fourth Directive was used as the opportunity to separate the tax accounts from the financial accounts.

Another important aspect of the Fourth Directive was the specification of formats for accounts, particularly the profit and loss statement. This had the effect of reducing freedom of action available to companies as well as increasing disclosure obligation. To alleviate some aspects of the disclosure requirements, Denmark negotiated that all items in the profit and loss account should have Arabic numerals instead of Roman numerals as originally proposed in the Fourth Directive. One aspect that has proved problematical is that the formats specified in the Directive tend to imply absorption costing whereas some Danish companies have used marginal costing.

The Nordic countries have a considerable number of similarities making harmonisation a logical step forward. The language of the region has many similarities with the exception of that prevailing in Finland. The Finnish language is different from many European languages apart from Hungarian and Estonian. However, the country is officially bilingual with Finnish being the first language and Swedish the second. An interesting aspect of Finnish accounting development is that 'there has seldom been any real language conflict between the Finnish-speaking majority and the Swedish-speaking minority since (the) 1930s, but the Nordic company law proposals and accounting issues divided the nation along language boundary although there were exceptions on both sides. This quarrel postponed the reform of the accounting law and company law considerably and slowed

down the development of legislation for five to 10 years' (pp. 75–76).

Finland has a relatively long history of accounting regulation with the first Accounting Act being passed in 1925. Traditionally, there has been a strong link between financial accounting and taxation. Also, bank finance in the form of debt has been very important in providing finance to companies and this may have had an inhibiting effect on the development of financial reporting because of access to inside information. However, stock issues became popular in the later part of the 1980s and the volume of trading on the Helsinki Stock Exchange grew rapidly between 1983 and 1989 but plunged just as quickly in 1990 and 1991.

An interesting aspect of Finnish accounting was the development of the Accounting Act of 1973 based on the Expenditure–Revenue Theory of Accounting of Professor Martti Saario, an approach developed after the Second World War. The foundation of this theory is the entrepreneurial theory of the firm in which the main objective is to determine the annual realised distributable income. The theory is based on the predominance of the profit and loss account over the balance sheet. Based on historical costs for valuation purposes a crucial concept is matching expenditures with realised revenues.

A particular aspect of Saario's theory is the notion of depreciation. In essence, the theoretical annual depreciation is equal to the expected annual income discounted at the time of purchase. This has the effect that the greater the income the greater the depreciation and vice versa. In practice, companies have tried to maximise depreciation within the tax rules but avoiding a loss so as not to waste tax deductible costs. The theory was well-accepted by the end of the 1960s, well before the 1973 Accounting Act.

Norway has a history of emphasis on law and regulation from the state. Therefore, it is no surprise that there is a strong link between tax and financial accounting. The extent of the importance attached to tax accounting is that for long periods measurement problems were virtually not discussed at all, but this was changed by the Companies Act and Accounting Act of 1991 and 1992.

A factor of considerable importance is that Norway has an open economy with substantial international business interests. Indeed, it is noticeable that in 1992 the shareholder structure of companies on the Norwegian stock market included foreign ownership 27% (the largest group), companies 24%, and individuals 12%. One result of this is that many Norwegian companies were using International Accounting Standards before the 1976 Accounting Act. In addition, consolidated accounts were prepared before a legal requirement was introduced.

International influences are also important on

Sweden as well as strong state and financial deregulation. As a result, major Swedish companies have been willing to adopt international accounting rules. Traditionally, Sweden has been a corporatist state and tax accounting and the use of untaxed reserves have been important in industrial policy. Only fairly recently have the financial markets become relatively important. One aspect of this development has been that US accounting debates are pre-eminent in developing accounting standards in Sweden, although recently international accounting standards have become important.

The final section of the book offers a useful synthesis. What is apparent is that German influence over the region was substantial prior to the Second World War but was superseded by the US. International accounting standards and developments within the EC have been influential, not least because Denmark is a member and has had some influence on the other Nordic countries. Government has been strong in each of the countries and tax accounting important. As the capital markets have grown in importance so financial reporting has become increasingly important.

In summary, this book is well-written and compiled and provides a considerable body of knowledge on each country. Since my book on Sweden was published in 1988, as part of the European Financial Reporting Series, I have advocated that there is a need for one book (rather than many) that covers the issues contained in this book. Others have not agreed with that view but this excellent volume has only served to reinforce my view. My one criticism is that the country chapters are sometimes a little parochial, not least in the reference sections which are restricted to publications in the country under review.

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T. E. Cooke

Audit Reports: A Practical Guide to Preparation Under SAS 600. David York. Kogan Page, 1994. iv + 376 pp. £39.95 h/b.

As the primary means of communication between auditors and users of corporate annual reports, the audit report has attracted much attention in recent years. In particular, a misunderstanding of its purpose has been identified as one of the reasons for the now popular phrase, 'audit expectations gap'. Therefore, it does not come as a surprise that after the Auditing Practices Board (APB) replaced the Auditing Practices Committee (APC) in May 1991, its first major task was to address the issue of the auditors' report. Hence, SAS 600, *Auditors' Reports on Financial Statements*, was the first audit standard issued by the APB in May 1993.

The APB believes that auditors' reports need to

provide more information to users of these reports, especially about the respective responsibilities of directors and auditors. According to the APB, 'an appreciation of the inter-relationship between the responsibilities of those who prepare financial statements and those who audit them is . . . necessary to achieve an understanding of the nature and context of the opinion expressed by the auditors' (APB, 1993, para. 3). Although in the Appendix to SAS 600 the APB provided examples of auditors' reports showing various forms of qualified and unqualified opinions, the examples are inadequate to provide enough guidance to enable auditors to report on various circumstances that practical considerations could necessitate. This is where this new text attempts to fill the gap.

Written by an experienced practitioner, *Audit Reports* 'is a practical guide for auditors explaining how to write even the most complex report'. The author suggests in the Preface that the book was already in writing even before SAS 600 was conceived and laments the failure of the APB to issue a SAS dealing with 'going concern' at the same time as SAS 600, thus leaving auditors 'to their own devices'. One advantage of producing the text more than a year after the issuance of SAS 600 is that the author has been able to include practical difficulties practitioners have encountered in compliance with the standard. Also, the text reveals areas where practitioners have differed in their reporting.

The text, consisting of six chapters, commences with an introductory chapter highlighting the contents and main issues discussed in the remaining chapters. In addition, the chapter draws attention to some 'famous blunders' in auditors' reports issued prior to the introduction of SAS 600. The author warns that such (reporting) 'blunders' may reappear 'in the future wearing new clothes'.

Chapter 2 presents a brief review of the statutory and professional regulations relating to the audit of companies. Following that, the chapter examines the basic elements including the options available in the standard ('clean' or unqualified) audit report. In addition, some sections of the chapter are devoted to the examination of the 'true and fair view' reporting requirement, the readability of the standard audit report introduced by SAS 600, and some guidelines for developing a standard audit report.

In Chapter 3 (the longest chapter in the text, spanning over 138 pages), the author presents detailed examples of modifications in the audit reports called for by special circumstances, such as the need to issue a qualified audit opinion, or to draw readers' attention to some matters. A list of such matters is also provided in the chapter. These include:

- a restriction on the scope of the audit;

- a disagreement with the accounting treatment or disclosure of a matter in the accounts;
- the need to draw attention to a fundamental inherent uncertainty in order to ensure that users appreciate fully the context in which the opinion was formed; and
- a need to include a matter not within the scope of SAS 600.

Chapter 4, which consolidates issues examined in Chapter 3, explains how to write audit reports requiring multiple modifications. In Chapter 5, the author provides 'illustrative modifications for typical circumstances that may confront auditors'.

Chapter 6, the shortest in the text, merely contains a comprehensive list or table of all the reports produced in the text. The chapter is useful as a quick referencing guide for a reader looking for an example report dealing with any particular issue.

On the whole, the text is presented in clear and easily understood language. The author deserves commendation for the considerable amount of time, effort and resources devoted to producing the text. The problem, however, is that the author assumes that the text can solve all audit reporting dilemmas that practitioners will encounter in practice. Such an assumption is questionable. This notwithstanding, the text could prove useful not only to practitioners, but also to students in higher institutions or those preparing for professional exams.

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E. N. M. Okike

Cases in Financial Accounting, Second Edition. G. Carnegie, J. Cravens and R. Gibson. Harcourt Brace, 1993. 283 pp.

Case study and similar illustrative material is always in demand for accounting courses, not only by instructors but also by students keen to be shown the practical significance of the concepts and techniques they are introduced to in their studies. This second edition of a case collection first published in 1989 introduces 60 new cases, together with 74 revised versions of items included in the first publication.

The term 'case study' can be used to cover quite a wide variety of teaching vehicles, from in-depth research-based studies of organisations to shorter illustrations of specific practical points of accounting. At a total of 134 cases this volume provides a sizeable collection of instructional material, but the fact that they cover only 283 pages gives some idea of the nature of what is meant by case study in this book. The cases are relatively short and highly focused. They are structured in order to provide illustration and examination of a single issue or

a small number of issues in accounting measurement and reporting, rather than to give unstructured cases which allow students to pursue more open-ended questions about accounting in organisations.

Each case is presented with a short summary introduction, followed by the case material itself, which may be as short as 10 lines, and then a set of requirements for students. The summaries are reproduced at the start of the book and this section is very helpful to any instructor in identifying cases to use. The cases are drawn from a variety of sources—financial statements, research reports, etc. Eighty are linked to acknowledged sources concerning real companies or situations; the remainder are fictional. A high proportion of the cases are based on press reports, and all except a few of these are drawn from the Australian and New Zealand context.

In assessing the strength and usefulness of this case collection, the individual cases are perhaps less important than the way they are organised into sections around separate accounting issues. Thirty topic groupings are used of subjects such as conceptual framework, asset revaluation, intangible assets, segment reporting and owners' equity. The book would be of greatest use to an instructor if, rather than trying to select a single case from those available on a particular topic, several of the cases or even the full set were used. This

seems to be the authors' purpose in putting the collection together—to provide a selection of material through which topics can be taught, rather than simply offering a library of illustrations from which a small number of items can be chosen. The structure of topic areas used by the authors is sufficiently wide to cover most of the areas of accounting commonly included in courses.

The usefulness of this book as a text for courses in financial accounting will therefore depend on the extent to which an instructor is willing to make a commitment to a case-based mode of instruction. Even on grounds of practicality and expense it would be difficult to justify requiring students to purchase the book unless a significant number of the cases are to be used.

The strengths of the book for adoption are the volume and comprehensiveness of the cases and the collection of different cases on each topic area. The weaknesses are the closed nature of much of the material and the fact that such a small number of the cases refer to situations outside Australia and New Zealand. Instructors may find it helpful to be able to refer to a sample of the situations in the cases as illustrations or anecdotes in the context of lectures, but this would fall short of the main object of this publication.

University of Manchester

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Contents

Articles

The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies	Vivien Beattie Stella Fearnley	227
---	-----------------------------------	-----

Earnings Forecast Revisions and Security Returns: Canadian Evidence	Sean M. Hennessey	240
---	-------------------	-----

Harmonisation of Accounting Measurement Practices in the European Community	Don Herrmann Wayne Thomas	253
---	------------------------------	-----

Recent Evidence on Australian Current Value Accounting Practices: Is the Phoenix Rising from the Ashes?	Stewart Jones Kerry Love	266
---	-----------------------------	-----

The Nature and Rationale of a Conceptual Framework for Financial Reporting by Islamic Banks	Rifaat Ahmed Abdel Karim	285
---	--------------------------	-----

The Information Contained in Reconciliations to Earnings Based on US Accounting Principles by Non-US Companies	Lynn L. Rees	301
--	--------------	-----

Commentaries

David Solomons and British Accounting	R. H. Parker	311
---------------------------------------	--------------	-----

David Solomons (1912-1995)—An Appreciation	Stephen A. Zeff	315
--	-----------------	-----

Book Review

Christian Lefebvre and John Flower, <i>European Financial Reporting Series. Belgium</i>	Ann Jorissen	320
---	--------------	-----

22 JAN 1996



Editorial

The objective of *Accounting and Business Research* is the publication of substantial and original contributions to knowledge in areas of accounting broadly defined. All research submissions are subject to anonymous review. We depend enormously on the goodwill and unstinting support of our peers in the academic community in ensuring that each manuscript is subjected to thorough and fair examination by experts in the field in question. We are extremely fortunate in being able to draw upon the services of a distinguished Editorial Board for this purpose. However, to avoid overloading the Board, and to ensure each submission is evaluated by leading researchers in the area, extensive use is made of a large network of occasional reviewers. The Summer 1995 issue (pp. 223–4) reported the names of the 140 ad hoc reviewers who ably and generously assisted us in this manner between April 1993 and December 1995. One-half are affiliated with UK institutions, a third are from North America and the remainder from Australasia and elsewhere. Their support is greatly appreciated.

The agenda of the accounting research community is always changing, both in response to new ideas and to shifts in the practice of accounting. The size of the Editorial Board has accordingly been substantially enlarged by the inclusion of 18 new members drawn from fields where experience has shown our need for advice is now greatest. We are delighted to be able to report that all the leading researchers we approached for this purpose have agreed to serve. Extensive use will continue to be made of ad hoc reviewers, as needs dictate. In this manner we will try to ensure that *Accounting and Business Research* continues its role as a leading full-range accounting research journal.

This issue of *Accounting and Business Research* includes a new Commentaries section which will, we hope, become a regular feature. Its purpose is to provide an outlet for articles of a somewhat different nature to those appearing in the research Articles section. We intend occasionally to commission review articles and analyses of issues of contemporary relevance to the research and professional accounting communities for the new Commentaries section. Unsolicited manuscripts of this nature will also be considered. Such papers will usually be subject to external review; but it is in their nature that the criteria for acceptance will tend to differ somewhat from those applied to conventional research articles. The creation of a separate section makes for a clearer demarcation than would otherwise be the case.

The Commentaries section in the current issue contains two memorial contributions marking the passing of David Solomons, one of the great figures of the academic accounting world, a man who made distinguished contributions to the development of accounting in both the UK and the US. He served for many years as a member of the Editorial Board of *Accounting and Business Research*. His wise counsel will be sadly missed.

K. V. Peasnell
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Objective of Accounting and Business Research

The objective of *Accounting and Business Research* is the publication of substantial and original contributions to knowledge in the areas of accounting broadly defined. Articles should be empirical or analytical; rigorous, yet preferably intelligible to a wide audience of academics and, where appropriate, practitioners. Presentation should be as elegant and economical as possible, avoiding unnecessary words, numbers or symbols.

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The Importance of Audit Firm Characteristics and the Drivers of Auditor Change in UK Listed Companies

Vivien Beattie and Stella Fearnley*

Abstract—This paper explores the importance of audit firm characteristics and the factors motivating auditor change based on questionnaire responses from 210 listed UK companies (a response rate of 70%). Twenty-nine potentially desirable auditor characteristics are identified from the extant literature and their importance elicited. Exploratory factor analysis reduces these variables to eight uncorrelated underlying dimensions: reputation/quality; acceptability to third parties; value for money; ability to provide non-audit services; small audit firm; specialist industry knowledge; non-Big Six large audit firm; and geographical proximity. Insights into the nature of 'the Big Six factor' emerge. Two thirds of companies had recently considered changing auditors; the main reasons cited being audit fee level, dissatisfaction with audit quality and changes in top management. Of those companies that considered change, 73% did not actually do so, the main reasons cited being fee reduction by the incumbent and avoidance of disruption. Thus audit fee levels are both a key precipitator of change and a key factor in retaining the status quo.

Introduction

Significant changes have occurred in the UK auditing environment during the last decade. The relaxation of ethical guidelines concerning advertising and solicitation, the introduction of auditor registration and monitoring and the economic recession have led to a relative shift in the cost and demand parameters of the audit services market and hence in competitive pressures. Observed behavioural changes by market participants include tendering, aggressive fee renegotiation and opinion shopping by auditees, and low-balling (i.e. predatory pricing), response to auditees' opinion shopping behaviour and merger activity by auditors.

Although it is difficult to make causal inferences, these changes have undoubtedly had an impact on the structure of the audit services market. Recent evidence concerning the UK listed company market indicates an increase in both seller concentration and the instability of client-auditor relationships (Beattie and Fearnley, 1994). Their study reports measures of seller concentration for the period 1987-1991 using a database of 2,079 fully listed and USM domestic companies. The increase in

the eight-firm concentration ratio from 0.64 to 0.79 was partitioned into three categories: a 0.09 increase attributable to audit firm mergers, a 0.07 increase due to voluntary client-auditor realignments and a countervailing decrease of 0.01 due to the impact of market entrants.¹ Thus both audit firm mergers and voluntary realignments were significant causes of the rise in concentration. At the 20-firm level, however, the overall increase from 0.83 to 0.9 resulted primarily from voluntary realignments.

Beattie and Fearnley (1994) also report that a total of 341 companies (16.4%) voluntarily changed their auditors at least once during 1987-1991. Of these changes, 40% were classed as intra-audit tier changes and 60% as inter-audit tier changes, with the tiers being defined as the top eight firms, firms 9-20 and those below the top 20. Given the overall increase in seller concentration, it is not surprising that the top tier gained the largest number of clients.

This macro-level description of change within the market for audit services can, however, offer limited insight into the competitive pressures and processes that give rise to the observed change. The present study therefore builds on existing research by examining the importance of audit firm characteristics and the factors motivating auditor change at the micro-level.

The extant auditor choice literature encompasses both the auditor change decision and the auditor selection decision. It is generally agreed that no comprehensive, well-specified theory of either

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¹The concentration ratios quoted are based on number of clients.

auditor change or selection currently exists, although empirical and theoretical research during the last 25 years has provided a theoretical framework within which such issues can be addressed.

To date, there has been no systematic empirical study of the auditor choice process in the UK. To our knowledge, existing empirical studies relate exclusively to the US, with the exception of an Australian study by Craswell (1988). Given the different environments (especially regulatory environments) that exist across countries, it is important to conduct auditor choice studies in different countries, and perform cross-country comparisons in order to gain new insights (Wallace, 1987). The purpose of this study is to contribute to the auditor choice literature by examining the influences on the auditor choice decision in a country where this decision has not been studied and following a period of rapid and significant environmental upheaval within the auditing profession (see above). A postal questionnaire survey of listed companies is used to elicit information concerning the importance of audit firm characteristics and factors that influence the auditor change decision. A random sample of 300 companies was surveyed, resulting in 210 usable replies, which represents a 70% response rate.

A factor analysis of 29 potentially desirable audit firm characteristics reveals a number of common underlying dimensions of importance to companies. The extent to which companies consider changing auditors, the main reasons for this and the reasons for not subsequently changing auditors are also explored.

The remainder of this paper is structured as follows. Section two reviews the extant auditor choice literature, which forms the basis of the content of the research instrument. Section three outlines the sample and data collection procedures employed. The results, together with discussion, are presented in the fourth section. The final section summarises and concludes.

Auditor choice literature

In conceptualising the auditor choice process it is important to recognise that auditor choice emerges from the client's characteristics, potential auditors' characteristics and the auditing environment. A significant change in one (or more) of these three areas is required for a client to decide to change their auditor, since the costs of switching are material.² The auditor change process is usefully separated into two stages, as suggested by Francis and Wilson (1988, p. 668), since the reasons for displacement of the former auditor might be unrelated to the specific choice criteria used in selecting

the new auditor. Companies first decide to change auditors and then make a reselection. Auditor displacement may be motivated by a change in company circumstances (i.e. by factors unconnected with the current audit firm's performance) such as a change in top management or by specific problems and disagreements. The reasons for change are, therefore, *not necessarily* related to generic audit firm characteristics and also *not necessarily* involved in the choice of a new auditor. Although there exists a *common* set of factors underlying change and choice decisions, both decisions also have unique factors.

The demand for audit services in free and regulated markets was examined by Wallace (1980). Three separate but interlinked sources of demand are identified: agency (or stewardship) demand, information demand and insurance demand. Agency theory, as developed by Jensen and Meckling (1976), indicates that the bonding role of an audit can reduce agency costs arising from the self-interested behaviour of agents. The existence of differential agency costs across clients and over time therefore results in a heterogeneous demand for audit services, characterised by DeAngelo (1981a, b) as different levels of audit quality.

The information demand for audit, originally explored by Dopuch and Simunic (1980 and 1982), is closely related to the agency demand, since it also arises from information asymmetries. The selection of credible auditors not only signals management's honesty and quality to all interested parties, but also reduces agency costs via the monitoring function. The arguments of both DeAngelo and Dopuch and Simunic are often referred to as the 'product differentiation hypothesis'. More recent analytical studies have employed the information/signalling framework to explore the implications of auditor choice (Bar-Yosef and Livnat, 1984; Titman and Trueman, 1986; and Dye, 1991). The insurance dimension of an audit forms the basis of the third source of demand. It is argued that the audit serves to indemnify investors and creditors against financial losses via the auditor's professional liability exposure.

Each of these three sources of audit demand generates a rank ordering of auditors. DeAngelo (1981b) argues that auditor size serves as a surrogate for audit quality, since larger firms have reduced incentives to lower audit quality opportunistically in order to retain any single client. Dopuch and Simunic (1980 and 1982) infer that credibility is associated with an auditor's reputation or brand name, based on the observed dominance of large

²It has since been recognised that industry-specific reputation is an important alternative basis for rating audit firm credibility (Simunic and Stein, 1986, p. 71).

³Both credibility and reputation refer to *perceived* audit quality, since audit quality *per se* is unobservable (or at least extremely costly to evaluate).

²DeAngelo (1981b, p. 188) cites the low rate at which firms change auditors as evidence of significant switching costs.

audit firms in the market for publicly-held company auditors.^{3,4} Finally, a number of writers argue that larger audit firms have 'deeper pockets' than smaller firms due to their higher level of insurance.

This consideration of demand-side factors suggests a number of client characteristics that will affect the *type* of audit firm selected, in terms of its quality and credibility. These characteristics centre on agency-related variables, such as size, level of gearing and management share ownership. These factors will determine the general size, class and/or industry specialisation of the audit firm selected. The *specific* audit firm chosen is also influenced by supply-side factors, i.e. auditor characteristics. In particular, audit firm specialisation in audit technologies can be expected to yield economies of both scale and scope.⁵

Additional auditor characteristics of relevance relate to the audit team, rather than the firm generally, and reflect the quality of working relationships. Other relevant client or auditor characteristics include the existence of significant foreign operations (Eichenseher, 1985), the existence of interlocking directorates between client companies (Davison et al., 1984), the association between client and auditor structures (Kaplan et al., 1990) and the geographical proximity of the auditor (Stokes, 1992). Based on these arguments, client-auditor alignments can be viewed as the minimum cost match between client needs and auditor services. A significant change in either the client or auditor's characteristics can therefore induce a realignment if the other party is either unable or unwilling to accommodate it.

Early empirical studies collected management's declared reasons for actual auditor changes using open-ended questionnaires (Burton and Roberts, 1967; Carpenter and Strawser, 1971; Bedingfield and Loeb, 1974; and Eichenseher and Shields, 1983). The most frequently cited reasons for change were changes in top management, need for additional services/dissatisfaction with services offered, audit fee too high, need for new financing, takeover by another company, poor working relationships and technical disagreements.

Statistical studies have examined the association between either (i) specific client or auditor characteristics and observed auditor choices, or (ii) *changes* in these characteristics and observed auditor *changes*. Firth and Smith (1992) find that the selection of a Big Eight audit firm (a brand name proxy for audit quality) is associated with agency cost variables and the need for signalling. The propensity to change auditors has been found to be positively related to disagreements (DeAngelo,

1982), financial distress (Schwartz and Menon, 1985), initial public offerings (Menon and Williams, 1991), the early and late stages of the auditor-client relationship (Levinthal and Fichman, 1988), and receipt of a qualified audit opinion (Chow and Rice, 1982; Craswell, 1988; and Citron and Taffler, 1992) (although this latter finding is not supported by Schwartz and Menon, 1985).⁶ The propensity to change auditors has, however, been found *not* to be related to the level of non-audit services purchased (De Berg et al., 1991).

In more recent multivariate studies, Williams (1988) finds that the propensity to change auditors is negatively related to the incumbent's industry specialisation and tenure and positively related to the receipt of adverse media publicity by the client company. Using panel data, Lindahl (1992) finds that client company financial distress, size and mergers, and the market share and size of the auditor are all associated with auditor changes. Haskins and Williams (1990) focus on intra-Big Eight auditor changes, finding that the most important factors associated with such changes are client financial distress, size and growth, together with audit firm fee levels and industry dominance.

Johnson and Lys (1990) report that the direction of auditor change, in terms of relative audit firm size (a proxy for differences in audit firm cost structures), can generally be attributed to changes in client characteristics that influence supplier costs (expansion, financing, profitability and audit risk). Francis and Wilson (1988) find that, after controlling for client size and growth, changes to/from a Big Eight firm are associated with agency cost variables. Healy and Lys (1986) find that companies audited by a non-Big Eight firm are more likely to retain a Big Eight acquirer following an audit firm merger if they benefit from the Big Eight firm's specialised services and/or reputation.

Studies have also examined several consequences of auditor change. Companies that change auditors following receipt of a qualified opinion have been shown in some studies to receive 'improved' opinions (Craswell, 1988), whereas other studies show no such shift (Chow and Rice, 1982 and Smith, 1986). DeBerg et al. (1991) find evidence that the level of non-audit services purchased declines following auditor change. Studies have shown generally negative overall share price reactions to auditor changes, although in most cases there are no systematic abnormal returns (Fried and Schiff, 1981; Nichols and Smith, 1983; Smith, 1988; and Johnson and Lys, 1990).

⁵Scale economies permit firms to offer competitive fees while scope economies, which result from knowledge spillovers, facilitate the provision of sophisticated audit services in addition to a range of non-audit services.

⁶Krishnan (1992) distinguishes 'internal' opinion shopping, where incumbent auditors and companies negotiate to reach a mutually acceptable opinion, from 'external' opinion shopping (a substitute behaviour), where companies search for more accommodating auditors. He finds that auditor changers, as failed internal opinion shoppers, face stricter standards than non-changers in the year prior to change.

There is, however, evidence that auditor changes associated with disagreements, qualified audit opinions and changes away from Big Eight auditors result in statistically significant negative price movements, especially at high levels of management ownership (Smith, 1988; Eichenscher et al., 1989; and Albrecht and Lamy, 1992). With regard to audit fee cutting following change, Francis (1984) finds no evidence of this whereas Simon and Francis (1988) and Ettredge and Greenberg (1992) find an average discount in the initial year of 24% and 25% respectively.⁷

Methods

Sample Selection and Construction of Mailing List

The sample is drawn from the population of domestic officially listed and USM companies in the UK and Ireland as at 30 April 1992. An alphabetical listing of company names was obtained from Extel Financial Ltd. This data set also contained addresses and the name of either the finance director or (in the absence of this) the company secretary. A systematic sample of 300 was selected from this list, i.e. every seventh company.

Research Materials and Questionnaire Administration Procedures

The questionnaire used closed-form questions and contained six sections. The first section contained general questions, while the second section elicited the importance of 29 audit firm characteristics using a five-point Likert-type scale with verbal anchors. Questions in the second section are framed as a generic task, in that no specific reference is made to the company's current audit firm. The third section identified those companies which had considered making a voluntary change in auditors during the past five years, elicited how seriously this change had been considered and asked the respondent to indicate which of 26 reasons caused a change to be considered. The remainder of the questionnaire forms part of a separate paper. The draft questionnaire was pre-tested with the assistance of several senior business executives and audit partners and the content, ordering and terminology was revised accordingly.

The reasons offered for considering an auditor change resulted from an analysis of the declared reasons for change cited in prior questionnaire studies and hypothesised variables from statistical auditor change studies, with 26 distinct themes being identified. The 29 auditor characteristics

whose importance was rated by respondents were derived by extracting relevant themes from the potential change drivers (rewording as necessary) and from a review of the auditor choice literature. Several additional characteristics were added during piloting.

The questionnaire was accompanied by an explanatory covering letter which assured the confidentiality of responses. A return envelope was also provided. The questionnaires were serially numbered to permit non-respondents to be followed up. A reminder letter was sent out after 10 days, with a second request (accompanied by a duplicate copy of the questionnaire and the original covering letter) being sent after a further 10 days.

Results

Response Rate and Tests for Bias

From the total sample of 300, 225 responses were received. Fifteen responses were not usable for a variety of reasons, leaving 210 usable replies, representing a response rate of 70%.⁸ This rate compares very favourably with those obtained in recent UK studies covering similar populations of companies and respondents.

A number of tests for response bias were performed. First, responding and non-responding companies were compared on the basis of size (measured as total assets) using the Wilcoxon-Mann-Whitney non-parametric test. The hypothesis that the two groups have been drawn from the same population was not rejected ($\alpha = 0.05$). This comparison was also applied to early (first 70) and late (last 70) responders, on the assumption that late responders are similar to non-responders (Oppenheim, 1966, p. 34). Again, the null hypothesis of no difference was not rejected ($\alpha = 0.05$).⁹ Finally, the companies were formed into four broad industrial groupings based on Stock Exchange groups (capital goods, consumer goods, other and financial). A chi-squared test indicated an association between industry and response/non-response ($\alpha = 0.01$). The percentage of responders was highest among the 'other' group (86%) and lowest among the financial group (61%). Despite the limitations of such tests (discussed by Wallace and Mellor, 1988), given the high response rate obtained, we conclude that response bias is not a serious threat to the validity of our results. Table 1

⁷Simon and Francis (1988) found that this fee discount in the initial year persisted, at reduced levels, for approximately two years, and appeared to result partly from 'low balling'. Ettredge and Greenberg (1992) found that the size of fee discounts in the initial year was associated with changes in audit quality and technological efficiency and the number of auditors bidding on the engagement.

⁸Five companies indicated that they did not wish to participate due to lack of management time, four said that their company policy was not to participate in questionnaires of this nature, three said that their auditor choice was in the hands of a parent company or comparable to another company in the sample, two said that the addressee had left the company and one company was in voluntary liquidation.

⁹Further tests for response bias comparing early and late responders were not conducted since the questionnaire did not contain suitable key summary variables.

Table 1
Analysis of Respondents by Company Size and Industry Group

Size group	Total assets (£m)	No.	%
Small	<20	74	35.9
Medium	20-100	80	38.8
Large	≥ 100	52	25.3
		<u>206*</u>	<u>100.0</u>

*Data on four newly listed companies were not available.

Industry group	Response rate	No.	%
Capital goods	74%	70	33.3
Consumer goods	63%	48	22.9
Other (including three oil and gas companies)	61%	50	23.8
Financial	86%	42	20.0
		<u>210</u>	<u>100.0</u>

provides an analysis of the respondents by size and industry.

A further factor that can affect the validity of questionnaire responses is the suitability of individual respondents, who should be both knowledgeable about the relevant practices, and involved in the relevant decisions at a senior level. Based on title, the respondents were: finance director (58%), company secretary (12%), financial controller (9%), director (6%), accountant (5%), chief accountant (3%) and other/not stated (7%). It is clear that nearly all respondents are senior executives who would be intimately involved in the auditor choice decision.¹⁰ The risk of uninformed respondent bias is therefore minimal.

Audit Firm Characteristics

Section two of the questionnaire asked respondents to indicate the importance to their company of each of 29 audit firm characteristics, using a scale of 1 to 5. The questions did not relate specifically to the company's current audit firm, rather they were set in a generic context. The results are summarised in Table 2. Over the group as a whole, the three most important characteristics to emerge were: (i) integrity of firm; (ii) technical competence of firm; and (iii) quality of working relationship with audit partner(s). When each individual respondent was asked to identify the three most important characteristics to them, technical competence of firm service was most frequently cited over the three slots ($n = 86$), followed by value for money of audit

($n = 84$) and quality of working relationship with audit partner ($n = 59$) (see Table 3). Interestingly, Big Six audit firm was cited by 40 companies as a top three characteristic, despite the fact that it ranked only 20th for the group of respondents as a whole.

Clearly there exist significant within-group variations in preferences with respect to audit firm characteristics. We investigated the extent to which company size or industry group could explain these differences. First, we classified the 210 respondents as small or large based on the median level of total assets. Using a two-tailed t-test, statistically significant differences (at the 10% level) between the two groups in terms of their responses to the 29 characteristics in Table 2 emerged for 11 characteristics (see third-last column of Table 2). Ten of these characteristics were rated as of significantly *more* importance by large companies: technical competence of audit partner; ethical standards of audit partner; technical competence of audit engagement staff; audit quality; willingness to offer guidance on accounting principles; quality of advice to management; Big Six audit firm; acceptability to company's regulators; specialist knowledge of your industry; and existence of offices located close to principal accounting functions. One characteristic was rated as of significantly *less* importance by large companies: low absolute level of audit fee.

Second, we classified the 210 respondents into four broad industrial groupings based on Stock Exchange groups (capital goods, consumer goods, financial and other) and conducted a Kruskal-Wallis test to determine whether any statistically significant differences existed among the four groups (Siegel and Castellan, 1988, pp. 206-212). Significant differences (at the 10% level) emerged for seven of the 29 characteristics: quality of working relationships with audit partner; willingness to offer guidance on accounting principles; same audit firm as other group companies; willingness to provide detailed cost information; specialist knowledge of your industry; existence of offices located close to principal accounting functions; and a local audit firm (see second-last column of Table 2). The first four of these characteristics were most important to capital goods companies, the fifth and seventh to financial companies and the sixth to consumer goods companies.

Subsequent multiple comparison procedures based on Tukey's studentised range test (SAS, 1990, ch. 13) revealed, however, that in the case of the second, sixth and seventh characteristics listed above, no *pairwise* comparisons were significant at the 5% level.¹¹ Capital goods companies rated the

¹⁰The questionnaire revealed that it is the finance director who is most frequently responsible for negotiating the audit fee with the auditors and who is most influential in the appointment process (detailed results not reported here).

¹¹This lack of any significant pairwise differences is not unusual, since the Tukey test is conservative in that it controls the type I experimentwise error rate.

Table 2
The Importance of Auditor Characteristics

T-test of difference between groups with/without audit committee											
Kruskal-Wallis test of difference between industry groups											
T-test of difference between small and large companies											
Auditor characteristic ¹	n	Distribution of responses (%) ²					Mean	Std. dev.	Prob. > T	Prob. > χ^2	Prob. > t
		1	2	3	4	5					
1. Integrity of firm	210	74.2	20.0	4.3	0.5	1.0	1.34	0.67	N.S.	N.S.	0.01
2. Technical competence of firm	209	69.8	24.4	3.8	1.0	1.0	1.39	0.70	N.S.	N.S.	0.00
3. Quality of working relationship with audit partner(s)	210	65.6	31.0	2.4	0.5	0.5	1.39	0.61	N.S.	0.02	0.03
4. Good reputation	206	63.2	32.5	1.9	0.0	2.4	1.46	0.76	N.S.	N.S.	N.S.
5. Technical competence of audit partner(s)	209	59.3	34.9	4.3	1.0	0.5	1.48	0.67	0.01	N.S.	0.00
6. Value for money of audit service	209	54.5	34.4	10.0	0.5	0.5	1.58	0.73	N.S.	N.S.	0.01
7. Ethical standards of audit partner(s)	209	51.2	42.1	4.8	1.4	0.5	1.58	0.70	0.00	N.S.	0.00
8. Technical competence of audit engagement staff	208	45.7	48.5	4.8	1.0	0.0	1.61	0.63	0.05	N.S.	0.02
9. Quality of working relationships with audit engagement staff	209	41.6	45.9	11.0	1.0	0.5	1.73	0.73	N.S.	N.S.	N.S.
10. Audit quality (i.e. ability to detect problems)	209	44.9	36.4	14.4	2.9	1.4	1.79	0.89	0.07	N.S.	0.00
11. Willingness to offer guidance on accounting principles	207	31.4	42.5	21.7	3.4	1.0	2.00	0.87	0.07	0.09	N.S.
12. Quality of advice to management, including management letters	206	35.0	38.9	15.5	8.7	1.9	2.04	1.02	0.08	N.S.	0.01
13. Ability to provide additional tax services	209	36.8	38.7	12.0	7.2	5.3	2.05	1.12	N.S.	N.S.	N.S.
14. Acceptability to company's major shareholders	207	33.3	35.8	23.7	5.3	1.9	2.07	0.98	N.S.	N.S.	N.S.
15. Same audit firm as other group companies	202	45.5	23.8	10.4	7.9	12.4	2.18	1.40	N.S.	0.00	N.S.
16. Willingness to provide detailed cost information	210	22.9	42.3	21.0	11.9	1.9	2.28	1.01	N.S.	0.04	N.S.
17. Acceptability to company's day-to-day bankers	207	28.0	33.4	22.7	8.2	7.7	2.34	1.19	N.S.	N.S.	N.S.
18. Acceptability to company's merchant bankers	203	24.1	38.5	23.6	6.4	7.4	2.34	1.13	N.S.	N.S.	N.S.
19. Acceptability to company's lenders	206	25.2	37.4	22.3	6.8	8.3	2.35	1.17	N.S.	N.S.	N.S.
20. Big Six audit firm	206	29.1	29.6	20.9	9.7	10.7	2.43	1.29	0.00	N.S.	0.00
21. Acceptability to company's regulators	208	22.1	33.6	26.0	10.6	7.7	2.48	1.17	0.03	N.S.	N.S.
22. Low absolute level of audit fee	207	15.0	31.9	36.7	12.1	4.3	2.59	1.02	0.03 ³	N.S.	N.S.
23. Specialist knowledge of your industry	209	17.2	33.5	25.4	15.8	8.1	2.64	1.18	0.00	0.00	0.01
24. Existence of offices located close to principal accounting functions	208	15.9	29.3	30.3	17.8	6.7	2.70	1.14	0.08	0.01	N.S.
25. Ability to provide additional consultancy services	209	5.3	26.2	24.9	25.4	18.2	3.25	1.18	N.S.	N.S.	0.02 ⁴
26. Ability to provide additional accounting services	209	7.7	20.1	21.1	34.8	16.3	3.32	1.19	N.S.	N.S.	N.S.
27. A non-Big Six international or national audit firm	175	9.1	20.6	21.1	22.3	26.9	3.37	1.32	N.S.	N.S.	N.S.
28. A regional audit firm	178	1.7	3.4	5.6	24.7	64.6	4.47	0.88	N.S.	N.S.	0.01 ⁴
29. A local audit firm	179	1.1	2.8	2.2	21.8	72.1	4.61	0.77	N.S.	0.09	N.S.

Notes:

¹Characteristics are ranked in decreasing order of importance.

²Response scale is 1 (very important); 2 (important); 3 (fairly important); 4 (of little importance); and 5 (not important at all).

³Characteristic rated significantly less important by large companies.

⁴Characteristics rated significantly less important by those companies with an audit committee.

Table 3
The Three Most Important Auditor Characteristics

Auditor characteristic	Individual ranking frequency*			Total†	Group rank (from Table 2)
	Most important	2nd most important	3rd most important		
1. Technical competence of firm	38 ¹	29 ¹	19 ³	86	2
2. Value for money of audit service	20 ³⁼	24 ²	40 ¹	84	6
3. Quality of working relationship with audit partner(s)	18 ⁶	16 ⁴	25 ²	59	3
4. Integrity of firm	20 ³⁼	20 ³	18 ⁴	58	1
5. Big Six audit firm	26 ²	8 ⁹⁼	5 ¹³⁼	40	20

Notes:

*Superscripts indicate the rank of characteristics *within* each top three slot (thus, for example, 18 respondents cited 'quality of working relationship with audit partner(s)' as the most important auditor characteristic and this was the sixth most frequently cited such reason).

†Auditor characteristics are shown in decreasing frequency of total citations *across* the three top slots.

quality of working relationship with audit partner and common group auditor of significantly more importance than financial companies, and willingness to provide detailed cost information of more importance than consumer goods companies. Financial companies rated specialist industry knowledge of more importance than the other three industrial groups.

Since 41% of the respondents had audit committees, we investigated whether this feature influenced the importance attributed to auditor characteristics. The final column of Table 2 reports the two-tailed significance level of a t-test between the two groups. Significant differences (at the 5% level) emerged for 13 of the 29 characteristics. With the exception of 'ability to provide additional consultancy services' and 'a regional audit firm', these characteristics were rated of *more* importance by companies with an audit committee.

It is to be expected that many of the 29 audit firm characteristics will be highly correlated. An exploratory factor analysis was performed using the principal components method with varimax rotation in an attempt to uncover the critical underlying dimensions. Eight initial factors were extracted, based on the eigenvalue ≥ 1 criterion (Kim and Mueller, 1978, p. 49). These factors explained 64% of the variance among the audit firm characteristics.

Table 4 summarises these eight factors, providing a subjective factor label based on each factor's constituent auditor characteristics. Those constituent characteristics with factor loadings greater than |0.50| (i.e. 25 out of 29) are also shown, together with their factor loadings. This analysis reveals the importance of auditors' acceptability to third parties and ability to provide non-audit services (factors two and four respectively), which are auditor characteristics not rating highly in Table 2. It is interesting to note that the auditor characteristic of being a Big Six firm does not emerge from the

factor analysis. In fact this characteristic appears to be multidimensional, being positively associated with factors 1, 2, 6 and 8, and negatively associated with factor 5 (the relevant factor loadings are 0.24, 0.28, 0.36, 0.37 and -0.29 respectively). This finding provides empirical support for the arguments that these firms enjoy a reputation that makes them more acceptable to third parties, that they are more likely to possess specialist industry knowledge and be located nearby. There are clearly, however, a significant number of companies which reject such firms in favour of either small audit firms (factor 5) or larger, non-Big Six audit firms (factor 7). Nor does the eighth-ranked auditor characteristic 'technical competence of audit engagement staff' appear in the factor analysis. This characteristic is two-dimensional, with positive loadings of 0.48 on factor 1 and 0.46 on factor 3.

It is noticeable from Tables 2 and 4 that there are several auditor characteristics that are not ranked of high importance, but which nevertheless load on factors. In particular, factor 2 (acceptability to third parties) comprises five related characteristics ranked 14, 17, 18, 19 and 21. This result can be attributed to the existence of five questions which clearly relate to the same dimension. While most respondents were concerned about the auditor's acceptability to a *specific* third party, there were very few concerned about more than one group (this is apparent from the high standard deviation in Table 2). Thus the *average* importance of each characteristic was low. In addition, factors 4-8 include characteristics of middle and low importance. There is, in fact, a distinct drop between factors 1-3 and 4-8 in the proportion of variance explained by these factors.

Auditor Change Consideration

Section three of the questionnaire asked our 210 respondents to indicate how seriously they

Table 4
Factor Analysis of Auditor Characteristics' Importance

<i>Factor number</i>	<i>Description label</i>	<i>Principal constituent auditor characteristics</i>	<i>Factor loadings</i>	<i>Table 2 ranking</i>
1.	Reputation/quality	Integrity of firm Technical competence of firm Good reputation Technical competence of auditor partner Audit quality Ethical standards of audit partner Acceptability to company's lenders Acceptability to company's day-to-day bankers Acceptability to company's merchant bankers Acceptability to company's regulators Acceptability to company's major shareholders Willingness to provide detailed cost information Quality of working relationships with audit engagement staff Value for money of audit service	0.85 0.81 0.72 0.72 0.58 0.56 0.87 0.85 0.85 0.64 0.56 0.73 0.66 0.63	1 2 4 5 10 7 19 17 18 21 14 16 9 6
2.	Acceptability of auditor to third parties	Willingness to offer guidance on accounting principles Quality of working relationship with audit partner Ability to provide additional tax services Ability to provide additional consultancy services Ability to provide additional accounting services A regional audit firm A local audit firm	0.59 0.58 0.79 0.71 0.66 0.87 0.86	11 3 13 25 26 28 29
3.	Value for money: cost information and working relationships	Specialist knowledge of client industry Ability to provide additional accounting services A non-Big Six international or national audit firm Quality of advice to management Existence of offices located close to principal accounting functions	0.75 0.51 0.73 0.52 0.70	23 26 27 12 24
4.	Ability to provide non-audit services			
5.	Small audit firm			
6.	Specialist industry knowledge			
7.	Non-Big Six (inter)national audit firm			
8.	Geographical proximity			

Table 5
Stated Reasons for Consideration of a Change in Auditor

<i>Reason*</i>	<i>Number of companies</i>	<i>% (n = 139)</i>
1. Level of audit fee	92	66
2. Dissatisfaction with audit quality (i.e. auditor's ability to detect problems)	46	33
3. Changes in company's top management	34	25
4. Company growth required increased technical capacity from audit firm	25	18
5. Need for group auditor rationalisation	24	17
6. High turnover of audit engagement staff	22	16
7=. Merger/takeover with/by another company	20	14
7=. Need for additional services	20	14
9=. Audit firm merger	19	14
9=. Use of inexperienced audit engagement staff	19	14
11. Need for Big Six audit firm	18	13
12. Personality clashes with audit partner/staff	17	12
13=. Change in audit partner	15	11
13=. Poor working relationships with audit partner/staff	15	11
15=. Need for multinational audit firm with foreign offices in same geographical areas as client's operations	12	9
15=. Disagreements over accounting principles	12	9
17=. Influence of merchant bankers/underwriter	10	7
17=. Inaccessibility of audit partner	10	7
19=. Influence of actual or potential equity or loan providers	7	5
19=. Need for audit firm specialising (or not) in client's industry	7	5
21. Need for national, rather than local, audit firm	6	4
22. Disagreement with audit opinion	5	4
23=. Influence of regulators	4	3
23=. Need for audit firm with local domestic office	4	3
25. Influence of company's day-to-day bankers	3	2
26. Need for local, rather than national, audit firm	1	1

*Reasons are shown in decreasing frequency of citation.

had considered changing their auditors in the past five years, and the reasons for this (selected from a list of 26 potential reasons). Only 34% had not considered changing their auditors at all, while 24% had considered the matter very seriously, 11% seriously, 10% fairly seriously and 21% casually. Table 5 provides a complete breakdown of all the stated reasons cited as contributing to the *consideration* of a change in auditor. It should be recognised that a number of the reasons cited overlap to some extent. For example, 'use of inexperienced audit engagement staff' (item ranked ninth equal) may contribute to an overall 'dissatisfaction with audit quality' (item ranked second). The 139 companies cited a total of 467 reasons, an average of 3.3 contributory reasons each.

The two most common reasons cited related to problems with the audit per se and were the level of audit fee (66%) and dissatisfaction with audit quality (defined as the auditor's ability to detect problems) (33%). Eighteen other reasons were, however, cited by a significant (i.e. $\geq 5\%$) percentage of companies. Of these reasons, five related to problems with the quality of the relationship with the audit team (high turnover of audit engagement staff, use of inexperienced audit engagement staff,

personality clashes with audit partner/staff, poor working relationships with audit partner/staff and inaccessibility of audit partner), eight related to structural changes at the auditee, (top management changes, growth, auditor rationalisation, merger, and need for additional services, Big Six firm, multinational firm or industry specialist), two related to changes concerning the audit firm (audit firm merger and change in audit partner), two related to third party influences (merchant banker/underwriter and capital providers) and one concerned disagreements over accounting principles.

Of the 56 companies that had undergone an *involuntary* change in auditor due to an audit firm merger (not shown in Table), 19 (33%) cited this as a contributory reason for considering further change. It may be noted, given the recent Cadbury Report (1992) recommendations on the rotation of audit partners, that 11% of respondents cited this as a reason for considering an auditor change. Disagreements concerning accounting principles were cited by 9% of companies as a reason for considering auditor change, with 4% citing disagreement with the audit opinion. This is suggestive that auditor changes may in some cases arise from 'opinion shopping'.

We again segmented the respondents into those with/without an audit committee. Based on chi-squared tests, there was no significant association (at the 5% level) between any of the top five stated reasons for considering change and the existence of an audit committee.

Also using a chi-squared test, we investigated whether the stated reasons for consideration of auditor change were associated with the *seriousness* with which change was considered. To avoid low cell frequencies, adjacent categories were combined to form a 'more serious' group ($n = 73$) and a 'less serious' group ($n = 66$). Four reasons were cited significantly more frequently (at the 5% level) by the more serious group: dissatisfaction with audit quality ($p = 0.001$); company growth ($p = 0.002$); auditor rationalisation ($p = 0.048$); and need for Big Six firm ($p = 0.001$). These issues relate primarily to structural changes at the auditee. Interestingly, however, the most frequently cited reason overall (level of audit fee) showed no statistically significant difference.

When asked to *rank* the three most important reasons for considering an auditor change, a similar pattern of responses to that in Table 5 emerged, as can be seen from Table 6.

Clearly there will, in many cases, exist a relationship between the desirability of audit firm characteristics and change drivers, since if a company is considering a change of auditor, then this *may* indicate that its current auditor is not satisfactory with respect to a characteristic which is rated

important (although there can be other reasons, e.g. an auditor rationalisation policy). We therefore investigated the consistency of the relationship between the three most important change drivers and the desirability of audit firm characteristics. We hypothesised that the 45 respondents who cited 'level of audit fee' as the most important reason for considering auditor change would rate 'low absolute level of audit fee' as a more important audit firm characteristic than the other respondents who had considered change. Based on a t-test, a statistically significant difference in the expected direction did exist between the two groups ($t = 1.79$, $p = 0.038$, one-tailed).

Similarly, we hypothesised that the 24 respondents who cited 'dissatisfaction with audit quality' as the second most important reason for considering auditor change would rate 'audit quality' as a more important characteristic than the others. In this case, although the difference between the two groups was in the expected direction, it was not statistically significant ($t = 1.08$, $p = 0.144$). The third most important reason for considering auditor change, 'changes in company's top management', has no related auditor characteristic.

Of the 139 companies that had considered changing their auditors, 37 (27%) did actually effect a change while 102 (73%) did not. The reasons given by the non-changers are summarised in Table 7. Fee reduction by the incumbent auditor was most frequently cited, either singly or in combination with other factors. The most common *single* reason

Table 6
The Three Most Important Stated Reasons for Considering Auditor Change

Stated reason	Individual ranking frequency*			Total†	Group citation frequency (from Table 5)
	Most important	2nd most important	3rd most important		
1. Level of audit fee	45 ¹	23 ¹	10 ¹⁼	78	1
2. Dissatisfaction with audit quality (i.e. auditor's ability to detect problems)	24 ²	6 ⁴⁼	10 ¹⁼	40	2
3. Changes in company's top management	6 ⁵	7 ³⁼	6 ⁴	19	3
4. High turnover of audit engagement staff	1 ¹⁶⁼	9 ²	5 ⁵	15	6
5. Need for group auditor rationalisation	4 ⁷⁼	7 ³⁼	4 ⁶⁼	15	5
6. Merger/takeover with/by another company	9 ³	4 ¹⁰	—	13	7=
7. Use of inexperienced audit engagement staff	2 ¹³⁼	1 ¹³⁼	8 ³	11	9=

Notes:

*Superscripts indicate the citation frequency of stated reason *within* each top three slot (thus, for example, six respondents cited 'changes in company's top management' as the most important reason for considering auditor change and this was the fifth most frequently cited such reason).

†Stated reasons are shown in decreasing frequency of total citations *across* the three top slots.

Table 7
Reasons for Not Changing Auditors Following Consideration of Change

<i>Reason</i>	<i>Number of companies</i>			<i>% (n = 102)</i>
	<i>Sole reason cited</i>	<i>Contributory reason</i>	<i>Combined frequency of citation</i>	
1. Incumbent auditor offered reduced audit fee	19	23	42	41
2. Avoidance of disruption and loss of management time	26	13	39	38
3. Incumbent auditor offered improved quality of service	14	14	28	27
4. Change of audit partner	3	—	3	3
5. 'Other'	13	7	20	20

Note: Reasons are shown in descending frequency of combined frequency of citation.

given was, however, avoidance of disruption and loss of management time. Three respondents mentioned change of audit partner as the single reason for not proceeding with the change. 'Other' reasons included inertia (four cases), decision pending (three cases), satisfaction with incumbent auditors (three cases), lack of suitable alternatives in the area (one case), advice from merchant bank (one case) and new shareholder did not insist (one case).

We examined the association between the top three most important stated reasons for considering auditor change and the main *sole* reasons for not subsequently changing auditors. Where level of audit fee prompted auditor change consideration, 50% did not change because the incumbent offered a reduced audit fee, 35% did not change to avoid disruption and loss of management time and 15% did not change because the incumbent offered an improved quality of service. The corresponding figures for dissatisfaction with audit quality and changes in company's top management were 12%, 44%, 44% and 25%, 25%, 50% respectively.

Discussion

The auditor choice process is clearly a complex one. Not only does it involve multi-attribute decision analysis, on the part of one or more individuals, but these attributes are constantly changing within a dynamic decision setting. Despite this, our analysis of 29 potentially desirable audit firm characteristics does reveal eight uncorrelated underlying dimensions: reputation/quality; acceptability to third parties; value for money; ability to provide non-audit services; small audit firm; specialist industry knowledge; non-Big Six large audit firm; and geographical proximity. These findings are generally consistent with the findings of Lynn (1987) in the US and of a recent UK survey (Fitzgerald, 1992). The UK survey was restricted to the consideration of six auditor characteristics and covered businesses of all sizes, although no precise sampling details are reported. Regular partner contact was ranked most important while the lowest competitive price was ranked least important.

Given the current debate concerning audit fee competition, an interesting finding to emerge from the present study is that, although value for money is ranked as the sixth most important audit firm characteristic in general, the low absolute level of audit fee is ranked only 22nd (see Table 2). In contrast, fee level is the most frequently cited reason for consideration of a *change* in auditor. Fee reduction by incumbent auditors was also the most frequently cited reason for *not* changing auditors. There are two possible explanations of this result. First, it should be noted that the value for money concept has two dimensions—price and quality. During piloting, value for money was a concept suggested to us several times as an important auditor characteristic, however it was *not* suggested to us as a change driver. It would appear that when considering change, auditees think in terms of price *or* quality, rather than their joint effect. We therefore maintained this perceptual distinction in the questionnaire. Second, it may be that expected audit fees exhibit greater variation between audit firms than other auditor characteristics, and thus will induce change more frequently.

In comparing Table 5 with Tables 2 and 4 it can be seen that in many cases auditor change is considered due to an emergent problem which affects a highly ranked auditor characteristic. For example, a high turnover of audit engagement staff has an adverse impact on the quality of working relationships with audit engagement staff. In other cases, a change in the structural characteristics of the auditee (e.g. company growth) changes the relative importance of auditor characteristics, with the incumbent no longer able to provide the required service. In a final class of cases, the structural characteristics of the auditor change (e.g. audit firm merger), with the result that the incumbent again fails to provide the service required.

Conclusion

The purpose of this paper is to contribute towards an understanding of auditor/client relationships,

since the changing nature of these relationships, in aggregate, profoundly affects the market for audit services in the UK. Questionnaire responses from 210 listed companies are analysed to reveal fundamental aspects of the auditor choice process, such as the importance of audit firm characteristics, the reasons for changing auditor and the reasons for retaining the incumbent.

Significant within-group variation existed in companies' views on the desirability of audit firm characteristics. This variation is partially explained in terms of company size and industry group. Large companies rated several characteristics (including technical competence, quality issues and specialist industry knowledge) of significantly more importance than small companies; large companies were, however, less concerned about the absolute audit fee, perhaps because it represents a smaller proportion of operating costs for such companies. Capital goods companies rated the quality of working relationship with audit partner and common group auditor of significantly more importance than financial companies, and willingness to provide detailed cost information of more importance than consumer goods companies. Financial companies, not surprisingly, rated specialist industry knowledge of more importance than the other three industrial groups.

Factor analysis revealed eight uncorrelated audit firm dimensions of importance to companies—the top four being reputation/quality, acceptability to third parties, value for money and ability to provide non-audit services. The nature of the much discussed 'Big Six factor' is partially revealed by our findings. This factor is itself multidimensional, encompassing, in particular, reputation/quality, acceptability to third parties and specialist industry knowledge. This provides empirical support for the quality, credibility and specialist knowledge arguments of DeAngelo (1981b), Dopuch and Simunic (1980 and 1982) and Simunic and Stein (1986) respectively.

Although the absolute level of audit fee was not ranked as an important audit firm characteristic over the sample as a whole, audit fees were the principal cause of *consideration* of auditor change. The 45 respondents who cited 'level of audit fee' as the most important reason for auditor change also tended to rate 'low absolute level of audit fee' as important. Changes in the structure of the audit firm, changes in the personnel of the audit team and top management changes within the auditee were also common destabilising influences. These changes principally include audit firm merger, change in audit partner (which is recommended in the Cadbury Code of Best Practice (1992)) and turnover of audit staff. Moreover, two-thirds of all companies have, to a greater or lesser degree, considered changing their auditors recently. This may be taken as an indication of underlying

instability in auditor/client relationships. Of those who considered change, but did not actually change, fee reduction by the incumbent was the most frequently cited reason for retaining the status quo.

This paper has two main limitations which are suggestive of further research. First, it must be emphasised that we have investigated the reasons for the *consideration* of auditor change and not the reasons for *actual* changes. Both issues are of interest in their own right, with the former permitting inferences about the latter. The number of respondents within our sample who *actually* changed auditors is quite low ($n = 36$), and does not permit meaningful analysis.¹² Second, this paper is based on the analysis of *declared* responses, collected by means of a postal questionnaire. Corroboration of these results using publicly available secondary data is desirable.

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Earnings Forecast Revisions and Security Returns: Canadian Evidence

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Abstract—The impact that revisions of financial analysts' forecasts of earnings have on Canadian security returns during the 1979–1988 period is tested using an event study methodology. A post-revision announcement drift in security prices is documented; the Canadian capital market displays a marked delay in reacting to positive revisions in earnings forecasts. Contingent on revision size, positive and significant excess returns are apparent for up to seven months following their release. The returns, before transaction costs, are not marginal; over a 12-month holding period, excess returns are 18.2%. The results for negative and non-revisions in earnings forecasts suggest that the market reacts quite efficiently to the information implicit in these events. An explanation for the asymmetrical results for the positive and negative revision portfolios is offered. These findings are robust to five control procedures used to test the sensitivity of the reported results to changes in the methodology. A number of explanations for this result are proposed including overlapping excess returns and beta shifts; none reconciles the anomalous results.

Introduction

Research exploring the properties of financial analysts' earnings forecasts has been intensive over the past decade. The bulk of the work analyses US earnings forecast data; little international evidence is available. This paper investigates one aspect of analysts' forecasts: the impact their revision has on security returns around the revision. This study is unique in that it uses Canadian data for a relatively long period, 1979–1988, and an event study methodology that considers the effects of all securities recording earnings forecast revisions.

A post-revision announcement drift in security prices for a portfolio of positive earnings forecast revisions is documented; the Canadian capital market displays a marked delay in reacting to this information. Conditional on revision size, returns of up to 6.6% in excess of the market are apparent during the three-month period *subsequent* to the release of positive revisions. Furthermore, the significant excess returns are not confined to a one or two-month period, rather, for some portfolios,

they are evident for up to seven months after revisions are publicly available. These findings are robust to the removal of outliers, changes in the method used to calculate excess returns and revisions, and non-synchronous trading concerns.

The pattern of excess returns for the portfolio of negative revision securities is consistent with market efficiency in both the pre- and post-revision period. A portfolio of securities whose forecasts are not revised is also formed. Given that a non-revision implies no new security information is released to the market, little security return reaction should be apparent in the time period surrounding a non-revision. This hypothesis is supported.

Therefore, this paper reports a pronounced difference in the way the Canadian capital market reacts to the information content of a revision: if downward, the market response appears to be efficient; if upward, a post-revision announcement drift in security prices is apparent. It seems profitable trading opportunities are available to market participants by simply purchasing securities whose forecasts have been revised upward; the larger the revision, the more attractive the opportunity. An interpretation for the asymmetrical results for the positive and negative revision portfolios is offered.

Three explanations for the reported results are suggested: earnings announcements released simultaneously with revisions, overlapping excess returns for successive monthly revisions, and risk shifts around the event date; none resolve the anomalous findings.

The remainder of the paper is organised as follows. The next section outlines the rationale for the study. The third section discusses the data sources and research design utilised. Section four

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details the frequency of the revision data. The empirical results are presented in the fifth section while section six describes the outcome of five control procedures utilised to test the robustness of the results. The seventh section discusses possible explanations for the findings. The final section concludes the paper.

Previous research and rationale for the current study

According to the Efficient Market Hypothesis (EMH), stock market prices accurately and instantaneously reflect all publicly available information influencing the value of a security. Trading strategies using analysts' earnings forecasts would only be expected to generate excess returns when these forecasts are more accurate than the earnings expectations impounded in current share prices. Furthermore, an efficient stock market should reflect the information implicit in an earnings forecast *revision* instantaneously. A delayed response suggests a market inefficiency; profitable trading rules could be devised that utilise forecast revisions.

To date, few published studies have considered this topic. Those studies available have, until recently, been limited to the US market with the methodologies utilised and the findings reported mixed. Givoly and Lakonishok (1979, 1980), Hawkins, Chamberlin and Daniel (1984), Imhoff and Lobo (1984), Brown, Foster and Noreen (1985), Benesh and Peterson (1986) and Stickel (1991) found that significant positive and/or negative risk-adjusted excess returns were earned in the time period following positive/negative revisions in analysts' earnings forecasts. Elton, Gruber and Gultekin (1981) and Abdel-Khalik and Ajinkya (1982) reported efficient market reaction to revisions.

In the only Canadian study addressing the revision issue, L'Her and Suret (1991) separated their sample into quintiles based on revision size and focused their tests on the extreme quintiles. They reported significant excess returns, before (but not after) transaction costs, in the post-revision period, for the extreme group of negative and positive revisions.

This paper augments and extends the previous work in three ways. First, a number of papers focus their tests on extreme groups of revisions. Ball (1978) suggests that earnings-based research focusing on extreme-ranked securities is susceptible to the model-misspecification hypothesis; the earnings variable tends to proxy for risk variables omitted from the equilibrium pricing model. Such studies tend to exhibit larger excess returns in the period subsequent to portfolio formation than do studies that control for this experimental pitfall.

The methodology used in this paper groups all securities recording earnings forecast revisions into portfolios based on sign and, as such, is much less open to the experimental problems Ball describes.

Second, the time period used in this study is much longer than that used in earlier studies. For example, though the study periods overlap, almost 47% of the revisions used in this study are from periods not sampled by L'Her and Suret. Third, some researchers exclude from their sample all securities followed by fewer than three analysts while this study considers all forecasts. This difference implies that the neglect effect (see Barry and Brown, 1984) may bias the results of this study in favour of finding a post-revision announcement drift. Hennessey (1993a,b), however, reports that widely followed, not neglected, securities record significant excess returns following revisions, implying a possible bias in the results reported in earlier earnings revision studies.

Data and research method

To be selected for the sample, companies were required to have security analyst earnings forecasts reported on the Canadian version of the Institutional Brokers Estimate System (IBES).¹ One of the principal items reported on the IBES is the mean or consensus analyst earnings forecast (CAEF) for the upcoming fiscal year: FY1. The CAEF is calculated monthly for each company using all individual analysts' forecasts available. Earnings forecast data for 1979–1988, for firms with 31 December fiscal year-ends, is used in this study. Monthly security returns were obtained from the 1989 version of the Laval-TSE Master File.

The direction and magnitude of revisions in the CAEF were calculated as follows:

$$V_{it} = \frac{F_{it} - F_{it-1}}{|F_{it-1}|} \quad (1)$$

where:

V_{it} = percentage change in forecasted EPS for security i during month t ;

F_{it} = CAEF for FY1 for security i reported in month t ;

F_{it-1} = CAEF for FY1 for security i reported in month $t - 1$.

The absolute value of the $t - 1$ forecast was used as the denominator to ensure forecasts for sample

¹The IBES is an earnings expectations database compiled and maintained by I/B/E/S Inc. The various versions of the IBES are described by Brown, Foster and Noreen (1985) and Philbrick and Ricks (1991) for US data, Hennessey (1991) for Canadian data, and Irvine and O'Hanlon (1990) for international data.

companies with negative CAEF at time $t - 1$ were retained and the revisions had the correct sign.² Screens were employed to ensure that only consecutive CAEF, for the same fiscal year, FY1, were sampled. Each month a positive, negative, or non-revision occurred, for each security i , was denoted month 0.

For each FY1 revision, 85 months of security and market returns were drawn from the Laval-TSE Master File; 72 months for the period prior to the revision (months $-72 \dots -1$), one for the month of the revision (month 0), and 12 for the months subsequent to the revision (months $+1 \dots +12$). This data was utilised first, to estimate the parameters of the market model for each revision using return data for the estimation period (months -72 to -13) and, second, to calculate excess returns for each of the revisions for each month of the test period (month -12 to $+12$) as follows:

$$R_{it} = \alpha_i + \beta_i(R_{mt}) \quad \text{for } t = \{\text{months } -72 \text{ to } -13\}$$

$$\epsilon_{it} = R_{it} - (\alpha_i + \beta_i(R_{mt})) \quad \text{for } t = \{\text{months } -12 \text{ to } +12\} \quad (2)$$

where:

R_{it} = rate of return on security i for month t ;

R_{mt} = rate of return on the equally-weighted Laval index;

α_i, β_i = parameters of the market model for security i ;

ϵ_{it} = excess return for revision i for month t .

The sample was then grouped into three portfolios based on revision sign and positive (PRP), negative (NRP), and non-revision (NON) portfolios formed. Portfolio excess returns and CARs were then calculated in the standard manner. The significance of these returns was tested using the Jaffe t -statistic which accounts for potential cross-sectional correlations in excess returns across securities.³

Frequency of revisions

Table 1 provides revision number and size statistics for the 197 companies recording earnings forecast revisions during the study period. Panel A of

Table 1 provides the number of events (revisions and non-revisions) yearly. As more companies enter the database, the number of revisions progressively increases.⁴

Panel B of Table 1 partitions the sample into positive and negative revision portfolios in total and by revision size (filter portfolios). As with the individual years, the majority of revisions for the filter portfolios are negative, with this tendency being more pronounced for the larger filters. A t -test on the yearly difference between the number of positive and negative revisions over the study period indicates that significantly more of the revisions are negative than positive for the complete sample and the four revision filters.

Panel C of Table 1 provides revision size statistics for the PRP and NRP. There are two items of note. First, the absolute value of revision size is greater for the NRP than for the PRP regardless of the indicator used for central tendency: mean, median or truncated mean. The mean with all revisions considered is -4.71% , which is significantly less than 0 at the 0.01 level. This, together with the large number of negative revisions, suggests a bias, the initial forecast is overestimated.⁵ Second, while both portfolios display a wide distribution of revisions, the standard deviation and range is much larger for the PRP than for the NRP. Thus, while the NRP has larger absolute revisions, the PRP revisions are more extreme.

⁴The frequency of revisions across months was also considered. While the hypothesis of equal distribution of revisions across months could not be rejected, the month recording the fewest revisions was March, followed closely by February. Stickel (1989) reported that analysts are less inclined to revise earnings estimates immediately prior to the release of the yearly earnings result. The preliminary announcement of annual earnings occurs approximately two and a half months following the fiscal year-end. Since March (the month of the earnings announcement) not February (the month prior to the release of the earnings report) records the fewest revisions, it is possible a reporting lag exists in the IBES database. This is investigated in the section discussing the results of the paper.

⁵Analysts' tendency to overestimate earnings (be overly optimistic), regardless of the forecast horizon, is well-documented. See, for example, McDonald (1973), Elton, Gruber and Gultekin (1981), Brown, Foster and Noreen (1985), O'Brien (1988), Klein (1990), DeBondt and Thaler (1990) and Ali, Klein and Rosenfeld (1992). This optimism may be related to institutional factors that motivate analysts to make forecasts that encourage trading and also ensure stable corporate relationships. For example, Affleck-Graves et al. (1990) suggest that brokerage firms make more money on buy than sell recommendations, and that pessimistic forecasts may hinder a brokerage firm's relations with a company. Francis and Philbrick (1993) argue that in a multi-task environment optimistic forecasts reflect a preference by analysts to cultivate management relations. These institutional 'pressures' may motivate analysts to overstate initial earnings forecasts. The overestimation bias will then be manifest via a series of negative revisions in periods subsequent to the initial forecast. This seems to be the case for this sample.

²A possible reason for different results between this and the L'Her and Suret study is the equation used by them to calculate revisions; the absolute value of the $t - 1$ forecast does not appear to have been used as the denominator. If so, then for companies with negative earnings forecasts, incorrect revision signs were recorded.

³Collins and Dent (1984), Brown and Warner (1985), and Chandra and Balachandran (1990) fully describe the Jaffe test statistic and suggest that this test procedure is appropriate when excess returns are cross-correlated, a distinct possibility in this study.

Results for event study

Table 2 displays the mean excess returns, Jaffe *t*-statistics, and CARs for the three revision portfolios for each month of the 25-month test period. Table 3 summarises the CARs for various time periods. Figure 1 plots the CARs over the test period.

Results in -12 to 0 Period

In the pre-revision period, the results are as expected given an efficient market. Significant excess returns, with the expected sign, are apparent in nine of the 12 pre-revision months for both the

PRP and NRP. The returns are not marginal; 16 of the 18 are significant at less than the 0.01 level. For the PRP, there is a progressive increase in the magnitude of the excess returns in the -10 to -3 period. A similar, though not constant, trend is also apparent for the NRP. Therefore, it appears the market anticipates the release of new information concerning the security. For the NON, eight of the 12 returns are positive but none is significant.

The results for month 0, the month of the revision, are surprising. While the excess returns for both the PRP and NRP are significant, they are less than those in each of the eight months prior to

Table 1
Number and Size of Earnings Revisions: By Revision Sign^a

Panel A: Number of revisions—by year and direction

Revision sign	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	Totals
Positive	71	65	48	31	50	104	359	354	571	496	2149
Negative	33	55	90	139	105	129	630	781	593	628	3183
Non-revision	101	119	114	134	154	272	396	441	554	590	2875
Total	205	339	252	304	309	505	1385	1576	1718	1714	8207

Panel B: Number of revisions—in total and by revision filter

Size of revision ^b	PRP		NRP		Total		<i>t</i> -statistic ^c
	Number	%	Number	%	Number	%	
0	2149	40.3	3183	59.7	5332	100.0	-2.39
2.5%	1287	36.7	2223	63.3	3510	100.0	-2.40
5.0%	886	34.6	1673	65.4	2559	100.0	-2.55
7.5%	670	33.3	1344	66.7	2014	100.0	-2.66
10.0%	520	32.2	1095	67.8	1615	100.0	-2.67

Panel C: Descriptive statistics relating to revision size^d

Size statistic	PRP	NRP
Mean	19.35	-25.22
Median	3.57	-5.62
Truncated mean ^e	7.16	-11.63
Standard deviation	180.10	111.02
Minimum	0.15	-2650.00
Maximum	7800.00	-0.16

Notes: ^aCategorisation by year and size of revisions which meet the data requirements of the study: a 31 December fiscal year-end and 85-months of return data on the Laval-TSE Master File. The determination of a revision is based on equation (1) in the text.

^bFor positive revisions, the revision numbers are for all revisions greater than the filter; for example, greater than 0, or greater than 2.5%. For negative revisions, the revision numbers are for all revisions less than the filter; for example, less than 0, or less than 2.5%.

^cThe *t*-statistic tests the hypothesis that the difference in the number of positive and negative revisions across the years of the study period is zero; the *t*-statistics indicate that the hypothesis can be rejected at the 0.05 significance level for all five filters.

^dAll revision size statistics are in percent.

^eThe truncated mean is calculated by ranking revisions by size, deleting the smallest and largest 5%, and then recalculating the mean.

Table 2
Monthly Excess Returns and CARs: Three Revision Portfolios

Month	Positive revisions		Negative revisions		Non-revisions	
	Mean ^{a,c}	Cumulative ^b	Mean ^{a,c}	Cumulative ^b	Mean ^{a,c}	Cumulative ^b
-12	0.2767 (0.99)	0.2767	-0.2431 (-1.28)	-0.2431	-0.0526 (-0.20)	-0.0526
-11	0.4947 (1.78)	0.7714	-0.0990 (-0.52)	-0.3421	-0.0964 (-0.37)	-0.1490
-10	0.3755 (1.35)	1.1469	-0.2699 (-1.42)	-0.6120	0.1254 (0.48)	-0.0236
-9	0.6248 (2.24)	1.7717	-0.3484 (-1.84)	-0.9604	-0.0609 (-0.23)	-0.0845
-8	0.8224 (2.95)	2.5941	-0.7927 (-4.18)	-1.7531	0.3397 (1.31)	0.2552
-7	0.8810 (3.16)	3.4751	-0.5721 (-3.01)	-2.3252	-0.0370 (-0.14)	0.2182
-6	0.9634 (3.46)	4.4385	-0.8218 (-4.33)	-3.1470	0.0924 (0.36)	0.3106
-5	1.0784 (3.87)	5.5169	-0.8018 (-4.23)	-3.9488	0.2269 (0.87)	0.5375
-4	1.1890 (4.27)	6.7059	-0.9056 (-4.77)	-4.8544	0.1991 (0.77)	0.7366
-3	1.5731 (5.65)	8.2790	-1.2058 (-6.35)	-6.0602	0.0017 (0.01)	0.7383
-2	1.4402 (5.17)	9.7192	-0.9123 (-4.81)	-6.9725	0.1855 (0.71)	0.9238
-1	1.3816 (4.96)	11.1008	-0.7404 (-3.90)	-7.7129	0.1022 (0.39)	1.0260
0	0.8064 (2.90)	11.9072	-0.3377 (-1.78)	-8.0506	0.2108 (0.81)	1.2368
1	0.9120 (3.28)	12.8192	-0.0779 (-0.41)	-8.1285	-0.1169 (-0.45)	1.1199
2	0.4930 (1.77)	13.3122	-0.4335 (-2.28)	-8.5620	0.5650 (2.17)	1.6849
3	0.8754 (3.14)	14.1876	-0.1616 (-0.85)	-8.7236	-0.1006 (-0.39)	1.5843
4	0.4450 (1.60)	14.6326	-0.2076 (-1.09)	-8.9312	0.4244 (1.63)	2.0087
5	0.3470 (1.25)	14.9796	-0.0059 (-0.03)	-8.9371	0.2441 (0.94)	2.2528
6	0.3341 (1.20)	15.3137	-0.2077 (-1.09)	-9.1448	0.0496 (0.19)	2.3024
7	0.3197 (1.15)	15.6334	-0.1193 (-0.63)	-9.2641	-0.0196 (-0.08)	2.2828
8	0.2521 (0.91)	15.8855	-0.0874 (-0.46)	-9.3515	-0.0968 (-0.37)	2.1860
9	0.1283 (0.46)	16.0138	0.0745 (0.39)	-9.2770	-0.0820 (-0.32)	2.1040
10	0.0545 (0.20)	16.0683	0.1822 (0.96)	-9.0948	-0.3221 (-1.24)	1.7819
11	0.1843 (0.66)	16.2526	0.1766 (0.93)	-8.9182	-0.0220 (-0.08)	1.7599
12	-0.1825 (-0.66)	16.0701	0.4564 (2.41)	-8.4618	-0.1137 (-0.44)	1.6462

Notes: ^aThe monthly excess returns for each portfolio are calculated as follows where $\epsilon_{it} = R_{it} - (\alpha_i + \beta_i(R_{mt}))$:

$$\epsilon_{pt} = \frac{\sum_{i=1}^{N_{pt}} \epsilon_{it}}{N_{pt}}$$

^bThe CAR for month t is the sum of the CAR for month $t-1$ and month t 's excess return.

^cJaffe t -statistics, in parenthesis, are calculated as follows where $S(\epsilon_p)$ is the estimate of the standard deviation of portfolio p 's excess returns during the estimation period (months -72 to -13). The Jaffe procedure accounts for potential cross-correlations in excess returns across securities since the variance of the portfolio residuals are estimated during the estimation period

$$t(\epsilon_{pt}) = \frac{\epsilon_{pt}}{S(\epsilon_p)}$$

Table 3
Cumulative Abnormal Returns for Various Time Periods: Three Revisions Portfolios

Time period over which CAR calculated	PRP		NRP		NON	
	CAR ^a	t-stat ^b	CAR ^a	t-stat ^b	CAR ^a	t-stat ^b
-12 to +12	16.07	10.23	-8.46	-8.14	1.65	1.14
-12 to -1	11.10	10.37	-7.71	-10.67	1.03	1.00
+1 to +12	4.16	3.86	-0.41	-0.56	0.41	0.38
+1 to +3	2.28	4.02	-0.67	-1.82	0.35	0.70
+1 to +6	3.41	4.36	-1.09	-2.02	1.07	1.55
+7 to +12	0.76	0.94	0.68	1.26	-0.66	-0.93

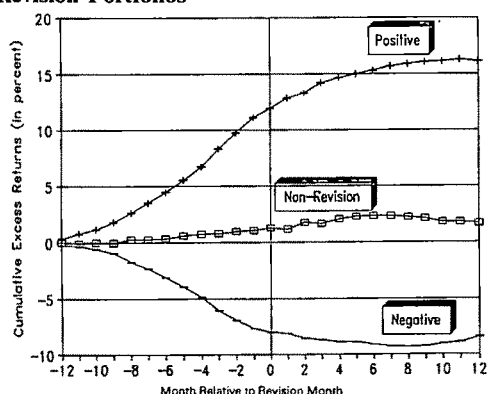
Notes: ^aThe CAR is calculated as follows where ϵ_{pt} is the excess return for portfolio p for month t:

$$CAR_p(x, y) = \sum_{t=x}^y \epsilon_{pt}$$

^bThe t-statistic is calculated as follows where $S(\epsilon_{pt})$ is the estimate of the standard deviation of portfolio p's excess return during the estimation period and cp is the number of months in the cumulation period x to y:

$$t(CAR_p) = \frac{CAR_p(x, y)}{S(\epsilon_p) \sqrt{cp}}$$

Figure 1
CARs Around Earnings Forecast Revisions: Three Revision Portfolios



the revision. This result is unexpected since the revision is only anticipated, not known with certainty. Therefore, its announcement is expected to have a more pronounced impact on returns.⁶ For both the PRP and NRP, however, the excess returns and t-values peak in month -3. There are three possible explanations for this result.

First, security analysts may be slow to react to changing information or they may simply react to

changes in market prices when revising earnings forecasts; that is, they extract information from prices movements and revise forecasts accordingly. If so, the continued employment of analysts is highly questionable. The latter rationale was studied by Brown, Foster and Noreen (1985) and Stickel (1990); both studies document a positive but very weak relationship between prior security returns and forecast revisions. Security price movements are more than likely considered by analysts when forecasting earnings; however, this would be only one of the items examined.⁷

Second, analysts revising an earnings estimate for a company may trade on this information for their own account and also encourage their employers and clients to trade before publicly releasing the revision. This information leakage would account for the excess returns in month -1 and may also account for the revision's reduced impact on returns in month 0.

Third, the IBES data may be subject to a reporting lag (as suggested in footnote 4). Perhaps by the time the revision appears on the IBES, it has been disseminated to the market. O'Brien (1988) reports that the mean time between the analysts' actual forecast data and the forecast's first appearance on the IBES is approximately seven weeks with a standard deviation of nine weeks. The publication lag is likely at least one month

⁶The results of the seminal studies of Ball and Brown (1968) and Beaver (1968) concerning the information content of annual earnings announcements certainly support this conjecture. In both studies it was shown that the market anticipated and correctly reacted to the information contained in the report of earnings in the period prior to its actual release. The most significant excess return reaction, however, was in the period of the earnings release.

⁷A related explanation states that analysts base revisions on good news released in the pre-revision period that is then manifest in the pattern of security returns. This explanation is similar to the first, and, if true, implies that analysts wait for up to five months before responding to the good news, an unlikely occurrence.

but could be as many as three. Therefore, an earnings forecast revised in June may not appear on the IBES until July, August, or even September. Assuming a month's delay, July would be treated as the revision month when, in reality, June is the event month. Thus, the current month -1 could be month 0. This would partially explain the lower than anticipated excess returns observed in month 0.

In summary, it appears the market anticipates the release of the information implicit in the revision of earnings forecasts. By the end of month 0 the CARs on both portfolios are highly significant: 11.91% for the PRP, -8.05% for the NRP. For the NON, the results are as expected: the excess return for month 0 and the CAR for the period month -12 to 0 are both marginal and insignificant.⁸

Results in +1 to +12 Period

As stated earlier, the unexpected result from this analysis concerns the excess returns observed in the post-revision period. For the PRP, highly significant excess returns are apparent in two of the first three months. For months $+4$ to $+7$, while the excess returns are marginally insignificant, the CAR is an economic 1.45%. Therefore, it could be argued, for seven months following an upward revision, positive and material excess returns are recorded. The CAR during this period is a highly significant 3.73%, an annualised equivalent of approximately 5.4%. The CAR for month $+1$ to $+3$ is a highly significant 2.28%.

For the NRP, significant negative excess returns are recorded in only one month subsequent to month 0. The CAR for the $+1$ to $+3$ period is -0.67% (-2.7% annually), a clearly marginal, non-economic return. For the NON in the post-revision period, excess returns are, as expected, small, mixed (eight negative, four positive) and generally insignificant (as are the CARs).

Overall, the results imply that the market does not immediately react to the new information associated with positive revisions in corporate earnings forecasts; a post-revision announcement drift in security prices is apparent. For negative revisions, the market appears to react quite rapidly

while little response to non-revisions of forecasts is observed.⁹

Comparison of Monthly Returns Across Portfolios

A two-sample t-test was utilised to determine whether significant differences exist between the monthly excess returns on the three revision portfolios. All possibilities were tested: PRP and NRP, PRP and NON, and NRP and NON. The results indicate that the hypothesis of equal excess returns between the three samples can be rejected in the eight-month period prior to the revision. It appears the market differentiates between securities that will experience a positive, negative, or non-revision in their CAEF. The significant differences in excess returns carry forward into the month of the revision and for five of the first six months for the post-revision period for the PRP and NRP comparison.

Results for Revision Filter Portfolios

To explore the impact revision size has on the results, a similar analysis to that described above was replicated for the four revision filter portfolios described in Table 1. Panel A of Table 4 provides information for the four revision filter portfolios similar to Table 3. Figures 2 and 3 display CARs for the pre- and post-revision periods for all portfolios. The most striking feature of this data is the uniform pattern of the results to the original.

For the PRPs, excess returns turn significant in month -8 or -9 and remain so until month $+6$ or $+7$ depending on the filter category. The magnitude of the returns is the only variation across portfolios; the CARs become progressively larger for the larger revision filters. For example, for the 10% filter portfolio, the CAR in the $+1$ to $+3$ period is 6.6% while in the $+1$ to $+12$ period it is an impressive 18.2%.

The results for the NRP are fundamentally the same across the four filter portfolios: the CARs reach a plateau in the -10% to -13% range by month 0 and remain flat or even increase during the remainder of the event period. Not a single negative excess return or CAR is significant in the $+1$ to $+12$ period. This consistent finding across the negative filter portfolios is striking.

To provide an indication of the changing pattern of excess returns over time, Panel B of Table 4 presents the results for the 10% revision filter portfolios by calendar year. Given the smaller number of observations in the early part of the study period, the results for 1979 to 1984 are grouped. An analysis of the three CARs suggests that while the yearly results are not identical, the

⁸These results are substantially different from those detailed in three previous papers that also studied earnings forecast revisions using an event study methodology. Givoly and Lakonishok (1979) reported that excess returns in the period preceding month -1 were small and insignificant. In contrast, Brown, Foster and Noreen (1985) documented highly significant excess returns in the period -12 to -1 for the three portfolios considered: positive, negative and non-revisions. Furthermore, the NRP recorded a CAR almost double that of the PRP (-9.39% versus 4.98%). The CAR for the non-revision portfolio was 1.58%. L'Her and Suret (1991) recorded a similar scaling; for the extreme group of negative (positive) revisions, the CARs were a significant -18.06% (8.91%) in the month -9 to -1 period.

⁹These conclusions apply regardless of the time revisions are deemed to be public: month 0 or month -1 . If month -1 was used, the conclusion of a post-revision announcement drift for the PRP is strengthened.

Table 4
Cumulative Excess Returns for Various Time Periods: The Revision Filter Portfolios

Panel A: CARs for the four revision filter portfolios^{a,b}

Time period over which CAR calculated	Positive revision portfolios				Negative revision portfolios			
	2.5%	5%	7.5%	10%	2.5%	5%	7.5%	10%
-12 to +12	25.27 [^]	29.88 [^]	30.73 [^]	33.84 [^]	-8.49 [^]	-8.81 [^]	-10.28 [^]	-10.09 [^]
-12 to -1	14.43 [^]	15.24 [^]	13.69 [^]	14.21 [^]	-9.47 [^]	-10.84 [^]	-12.47 [^]	-13.21 [^]
+1 to +12	9.63 [^]	13.46 [^]	15.87 [^]	18.19 [^]	1.17	2.29	2.33	3.07*
+1 to +3	3.98 [^]	5.15 [^]	6.11 [^]	6.61 [^]	-0.21	-0.35	-0.35	-0.42
+1 to +6	6.72 [^]	9.04 [^]	10.61 [^]	11.66 [^]	-0.52	-0.12	-0.09	0.18
+7 to +12	2.91*	4.41 [^]	5.27 [^]	6.53 [^]	1.69*	2.41*	2.42*	2.88*

Panel B: CARs for the 10% revision filter portfolio by calendar year^{a,b}

Year	Positive revision portfolios			Negative revision portfolios		
	-12 to -1	+1 to +3	+1 to +12	-12 to -1	+1 to +3	+1 to +12
1979-84	4.73	0.12	-1.00	-2.96	1.55	7.89 [^]
1985	3.87	4.00*	3.23	-20.18 [^]	-4.73*	-10.03 [^]
1986	9.54*	4.22*	10.16 [^]	-24.45 [^]	-2.19	6.02*
1987	19.33 [^]	11.54 [^]	32.79 [^]	-8.77*	1.46	16.56 [^]
1988	28.89 [^]	9.11 [^]	30.57 [^]	-4.11	3.48*	-0.71

Notes: ^{a,b}The CARs and t-statistics are calculated as explained in the notes for Table 3. The symbols * and [^] indicate that the CARs are significant at the 0.05 and 0.01 levels respectively.

patterns are consistent across years and to the overall results presented earlier.

Consideration of Transaction Costs

The yearly excess returns for the PRP documented above are before transaction costs. An important question to consider is: would the excess returns still be economic with bid-ask spreads and brokerage costs considered? Brokerage costs for a trade of as few as 300 shares, through Canadian discount brokers, are less than 1%. For larger

trades (800 shares) the cost is reduced to 0.5% per trade. Assuming an average cost of 0.75% per trade and a 100% portfolio turnover, brokerage costs reduce the yearly excess return by, at most, 1.5%.

Bid-ask spreads will reduce the magnitude of the excess returns; the bid-ask spread for very small companies may be as large as 10%. For example, in a recent Canadian study, Foerster and Porter (1993) reported that adjusting for the 'bid-ask bias' reduced the small firm minus large firm mean daily

Figure 2
CARs By Event Period Around Positive Forecast Revisions: By Filter Portfolios

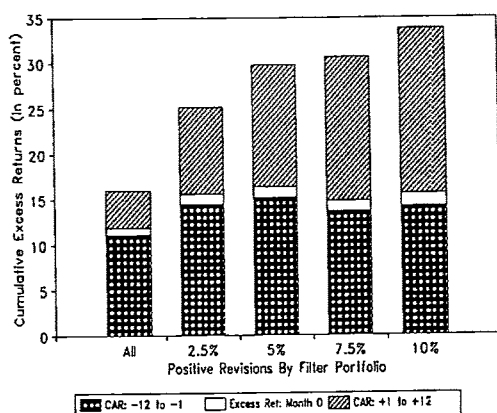
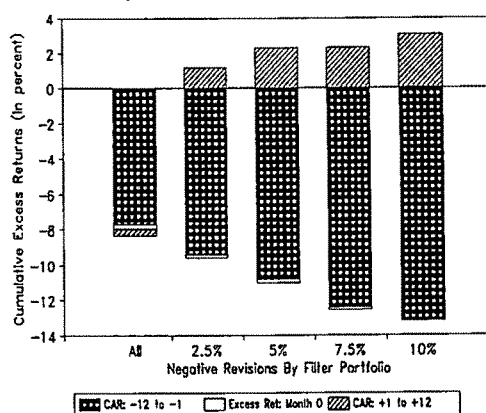


Figure 3
CARs by Event Period Around Negative Forecast Revisions: By Filter Portfolios



excess return by almost 50%. The vast majority of this reduction was associated with the small firm quintile.

The bid-ask bias is likely to be less pronounced for this study since the sample securities are the largest and most frequently traded in Canada and, thus, less subject to large bid-ask spreads. For example, the median market value for the small firm quintile in the Foerster and Porter study was C\$2.1m. In contrast, the median market value for the small firm portfolio in this study is C\$96.2m.

The exact magnitude of the bid-ask spread for this sample is difficult to measure given the scarcity of Canadian data. Keim (1989) reports that the average bid-ask spread for market value deciles of NYSE/AMEX listed securities ranges from 0.58% for the largest to 6.6% for the smallest. The average for the five smallest deciles on the AMEX (an exchange more similar to the TSE than is the NYSE) was 2.8%. However, Madhavan et al. (1994), using NYSE transaction-level data, report that the actual execution costs of trading are significantly lower than the cost implied by the bid-ask spread.

It is most likely true that the securities included in the Keim and Madhavan et al. studies are not totally representative of the securities included in this study's sample. The effect will be larger bid-ask spreads and higher trading costs. Therefore, it is probable that transaction costs will consume the annual excess return of 6.4% on the entire PRP (given it implies two round trip trades per year). It is highly doubtful, however, whether transaction costs will completely consume the yearly excess return of 18.2% on the 10% revision filter portfolio. It is reasonable to conclude that the after-transaction cost excess return will be, at least, 10%. This conclusion is strengthened given that these returns are based on the conservative selection of month 0 as the event month rather than the more likely month -1.

Explanation for the Asymmetrical Results for the PRP and NRP

As discussed earlier the asymmetrical results for the PRP and NRP are surprising. In the pre-revision period, the market anticipates reductions in earnings forecasts but, after their release, even for the very large negative revisions, excess returns are flat or even positive, a market response directly opposite to that for the PRP. The reason for this effect may be related to analysts' well-documented tendency to overestimate earnings, as discussed in footnote 5.

The overestimation bias may be, in part, associated with negative events. For example, Klein (1990) demonstrates that analysts' forecasts are over-optimistic following periods of poor stock performance, Abarbanell and Bernard (1992) re-

port over-optimism following weak earnings performance, while Ali, Klein and Rosenfeld (1992) establish that overly optimistic forecasts are most pronounced for firms that recently experienced earnings losses. Hennessey (1994), using Canadian data, reports that analysts' forecasts resulting in positive revisions are, generally, rational while forecasts resulting in negative revisions are optimistic.

If earnings forecasts associated with negative events are optimistic (irrational), investors should place little faith in the forecasts and the market may even respond in a contrary manner to the extreme earnings forecast revisions. There appears to be some support for this. Hennessey (1994) reports that excess returns in the year following extreme negative revisions are positive. In contrast, Abarbanell and Bernard (1992) report negative excess returns in the year following extreme positive revisions. Both results are indicative of stock price *under-reaction*, implying the market ignores or puts little credence in extreme forecast revisions.¹⁰

The market under-reactions documented above involve different signed revisions suggesting a sample difference. The reason for this difference is not clear but it is interesting to note that the asymmetrical results for a Canadian sample are opposite to the asymmetrical results for a US sample. It seems clear, however, that both reactions are associated with extreme revisions of analysts' earnings forecasts.

Control procedures

To test the sensitivity of the reported results, five control procedures were utilised. First, to ensure outliers do not drive the results, the 50 largest (PRP) and smallest (NRP) revisions were deleted from the sample. The excess returns and CARs were almost identical to the original. A two-sample t-test comparing the excess returns did not reveal a single significant difference. Therefore, outliers do not account for the excess returns for either the PRP or NRP.¹¹

Second, if the process that generates security returns is correctly specified, then, for a random sample, the average excess return observed in a month should not be significantly different from

¹⁰Dugar and Nathan (1992) and Ackert et al. (1994) find that individuals place little faith in overly-optimistic forecasts and have great difficulty using highly biased forecasts. As a consequence, individuals become unwilling to acquire high bias earnings forecasts.

¹¹To test the sensitivity of this result to the number of outliers deleted, the above procedures were replicated by eliminating the 100 largest (smallest) revisions. Once again, the excess return series was very similar to the original findings.

zero. If the sample is not random, excess returns may be observed during some periods. To avoid attributing this outcome to the signal being studied (earnings forecast revisions), the cross-sectional mean excess return (the mean monthly excess return on all sample securities) was subtracted from ϵ_{it} to calculate a standardised excess return for each revision as follows:

$$d_{it} = \epsilon_{it} - \bar{\epsilon}_t \quad (3)$$

where:

d_{it} = the standardised excess return for revision i for month t ;

$\bar{\epsilon}_t$ = mean excess return on all sample securities in month t .

By performing this transformation, the mean standardised excess return for each month of the sample period is zero, as is the mean of d_{it} for the entire sample. This allows for easier interpretation of the results; d_{it} is the monthly excess return associated with holding security i versus buying-and-holding the sample. The excess returns, for the three portfolios, calculated using this procedure were very similar to the original series.

Third, revisions were calculated using the security's market price as the denominator in (1). If the method used to calculate revisions has an impact on the results, then differences in excess returns should be observed for various revision filters. The four revision filters were evaluated; the excess returns and CARs during the test period were essentially identical to the original.

Fourth, many securities listed on the TSE experience extremely thin trading while others trade very regularly.¹² Dimson (1979) reports that securities subject to thin trading and those that trade very frequently, in relation to the securities in the market index, are prone to beta estimation difficulties when OLS regression is used. The bias associated with the OLS estimates generally results in an underestimation of the 'true' beta for an infrequently traded security and overestimation for a frequently traded security. This may bias the results for studies that rely on estimates for excess returns. To evaluate the impact of this perceived problem, the Dimson aggregation procedure was used to calculate excess returns for the three revision portfolios. The results were indistinguishable from the original series of excess returns.

Fifth, to determine the effect the excess return calculation method has on the results, market-adjusted returns (difference between the security and market returns) were calculated. This proxy for excess returns was very similar to the original series of returns.

Therefore, the results reported in the previous section appear robust to changes in the methodology used to test for efficient market reaction to revisions in earnings forecasts.

Possible explanations for results reported

Earnings Announcements Released Simultaneously with Revisions

Stickel (1989) reports that earnings announcements lead revisions in earnings forecasts implying that studies reporting excess returns after earnings announcements¹³ and those reporting excess returns after forecast revisions may simply be documenting the same phenomenon (a proxy effect). There are three reasons to question the validity of this explanation. First, applying this logic to the current study suggests that only securities recording positive revisions also report earnings in the same time period since only this portfolio experiences excess returns subsequent to the period of the revision. This, of course, is not rational.

Second, Givoly and Lakonishok (1979), Imhoff and Lobo (1984), L'Her and Suret (1991) and Stickel (1991) control for the confounding effects of interim earnings announcements yet report similar findings in the post-revision period for the revision sample. This suggests that the forecast revision effect is independent of the earnings announcement effect; revisions appear to provide information to the market beyond that implicit in earnings announcements.¹⁴ Third, Thompson (1988) reported that extraneous individual firm events occurring contemporaneously with the event being studied have little impact on the results reported for event studies.

Overlapping Excess Returns

Given the design of the study, it is possible that a single security may record multiple earnings forecast revisions, with the same sign, in a single fiscal year. This is especially the case with consensus earnings forecast data. If so, it is possible that consecutive revisions for individual firms are serially correlated, a potential complication in an event study investigating returns around revisions. To explore this issue, two tests were run. First, serial correlation coefficients were calculated for all sample securities for six lags; all coefficients were small and insignificant.

¹³See Bernard (1992) for a review of this literature.

¹⁴Stickel (1991) reported similar findings for two other confounding events: dividend and stock-split announcements. Similar conclusions have been reached in other studies investigating earnings forecasts and security returns. For example, Beneish (1991) found that excess returns surrounding publication of recommendations in the 'Heard on the Street' column of the *Wall Street Journal* were similar when all recommendations were considered and when firms with confounding information releases were eliminated from the sample.

¹²Griffiths (1991) provides an analysis of trading frequency for TSE listed securities.

Table 5
Rolling Beta for the Three Revision Portfolios for Various
Months of the Event Period^a

<i>Event month</i>	<i>Revision portfolio</i>		
	<i>Positive</i>	<i>Negative</i>	<i>Non-revision</i>
-13	1.058	1.059	1.040
-12	1.057	1.055	1.040
-6	1.054	1.043	1.033
-3	1.052	1.038	1.028
0	1.047	1.032	1.022
+3	1.042	1.031	1.017
+6	1.039	1.030	1.008
+12	1.032	1.020	0.996

Note: ^aMean betas for all securities recording positive, negative, or non-revisions of earnings forecasts during the sample period 1979–1988. Betas are calculated using the standard market model and 60 months of security and market returns ending with the event month. That is, the beta for event month -12 was calculated using security and market returns for the period month -71 to -12.

Second, to minimise the potential for overlapping excess return affecting the reported results, a gap of three months was forced between revisions with the same sign for each security. That is, if security *i* recorded a positive revision in May 1985, the next month a positive revision for security *i* could be included in the sample is September 1985. Table 2 indicates that much of the reaction to revisions occurs in the seven months around the event. The three-month gap ensures that these excess returns are not counted more than once.

The results (not reported) for the complete sample of positive, negative and non-revisions change none of the conclusions. While the sample sizes for the three portfolios are reduced by close to 50%, the magnitude of the excess returns in the post-event period are essentially identical. For example, in the +1 to +12 period, the CARs for the PRP, NRP and NON are 3.64%, -0.60% and 0.49% respectively; figures that are little changed from those in Table 3.

The above results are not surprising for two reasons. First, Lys and Sohn (1990) report that earnings forecast revisions are significantly related to security and market returns regardless of the time between revisions, even as short a period as three days. It appears investors perceive forecast revisions as informative and that analysts act independently when revising their forecasts. Second, Stickel (1991) also excluded overlapping revisions from his sample and the reported results were unaffected.

Risk Shifts

Risk shifts are becoming an increasingly important issue in event-study research. It is now well-

documented that security risk (as measured by beta) shifts during the event period, especially for small firms. Ball, Kothari and Watts (1993) document large changes in beta around earnings-related events with much of the change being associated with the extreme ranked portfolios. Porter (1993) reports risk shifts around stock splits using Canadian data; however, in this case, security risk declines in the period subsequent to the split. Given this evidence of risk shifts and the different direction of the shifts, it is important to consider the impact such shifts may have on this study's results.

To do this, a rolling beta was calculated for each security for each month of the event period using the immediately preceding 60 months of return data. For example, the beta for the estimation period is calculated using security and market returns for the period month -72 to -13. To calculate the rolling beta for event month -12, security and market returns for the month -71 to -12 were used. This rolling procedure was repeated 24 times ending with the beta calculation for month +12 using return data for the period month -47 to +12. This procedure highlights how the beta for each security evolves during the test period.

Table 5 provides mean betas for the PRP, NRP and NON for the estimation period and selected months of the test period. It is clear that the beta shifts are very minor and do not account for the reported results. For example, for the PRP, the decrease in beta between month -13 and month +12 is 0.026. This beta shift implies an under-estimation of the excess returns. In this regard, these results closely parallel those of Porter (1993).

Conclusion

This paper analysed, using Canadian data, the impact that revisions in analysts' earnings forecasts have on security returns around the time of the revision. A post-revision announcement drift in security prices is documented; the Canadian capital market displays a marked delay in reacting to positive revisions in earnings forecasts. The significant excess returns reported in the post-revision period are not confined to one or two months; contingent on revision size they are apparent up to seven months after the revision is publicly available. Opportunity exists for investors to earn significant risk-adjusted returns by trading on public information. The larger the revision, the more attractive the opportunity; before transaction costs, yearly excess returns of 18.2% are reported. After transaction costs, excess returns are likely in excess of 10%.

This finding is robust to the removal of outliers, changes in the method used to calculate excess returns, changes in the method used to calculate revisions, and to non-synchronous trading concerns. Three explanations are proposed to explain the results, including simultaneous earnings announcements, overlapping excess returns associated with revisions in consensus earnings forecasts, and risk shifts around revisions; none resolve the anomalous results.

For negative and non-revisions, the market appears to respond efficiently. The reason for the asymmetrical response to positive and negative revisions may be related to analysts' tendency to overestimate earnings following negative events, particularly for extreme forecast revisions. Stock price *under-reaction* is evident, implying that the market ignores or puts little credence in extreme forecast revisions around negative, firm specific, events. This market under-reaction is evident with extreme, though different signed, revisions in both a Canadian and US sample. While definitive conclusions cannot be drawn concerning the asymmetrical results, it seems clear that extreme earnings forecasts following negative events are viewed by the market as a unique subset of revisions.

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JOURNAL OF ACCOUNTING & ECONOMICS

Table of Contents

Volume 18, Number 3
November 1994

Editorial Data

Karen Hopper Wruck and Michael C. Jensen

Science, Specific Knowledge and Total Quality Management

Daniel W. Collins, S. P. Kothari, Jay Shanken and Richard G. Sloan

Lack of Timeliness and Noise as Explanations for the Low Contemporaneous Return-Earnings Association

P. Jane Saly

Repricing Executive Stock Options in a Down Market

Rajiv D. Banker, Gordon Potter and Roger G. Schroeder

An Empirical Analysis of Manufacturing Overhead Cost Drivers

Walter G. Blacconiere and Dennis M. Patten

Environmental Disclosures, Regulatory Costs and Changes in Firm Value

David A. Guenther

The Relation Between Tax Rates and Pre-Tax Returns: Direct Evidence from the 1981 and 1986 Tax Rate Reductions

Advertisements

Harmonisation of Accounting Measurement Practices in the European Community

Don Herrmann and Wayne Thomas*

Abstract—This study attempts to determine the level of accounting harmonisation in the European Community by examining selected measurement practices from the 1992/93 annual reports of companies from Belgium, Denmark, France, Germany, Ireland, the Netherlands, Portugal and the UK. Harmonisation is tested using the chi-square statistic and measured using the *I* index. The chi-square statistic tests for the equality of the proportions of accounting measurement methods across countries. The *I* index measures the extent of concentration around a particular accounting measurement method. The results reveal that accounting for foreign currency translation of assets and liabilities, treatment of translation differences, and inventory valuation are harmonised, while accounting for fixed asset valuation, depreciation, goodwill, research and development costs, inventory costing, and foreign currency translation of revenues and expenses are not harmonised. The results also demonstrate that the extent of harmonisation is greater among fairness oriented countries than among legalistic countries.

Introduction

There are three primary questions of interest in the area of accounting harmonisation: Is there a need for harmonised accounting practices? What factors are the most favourable and the most obstructive to the harmonisation process? And to what extent are current practices harmonised? Answers to these questions are important to a wide variety of financial statement users, including stockholders, creditors, analysts, standard-setters, regulators and economic planners.

Regarding the first question, some have argued that harmonisation of accounting practices is not only unnecessary (Choi and Levich, 1991; Goeltz, 1992), but potentially harmful in certain contexts (Fantl, 1971; Samuels and Oliga, 1982). However, efforts by several international organisations indicate that these organisations consider harmonisation of accounting practices to be a worthwhile pursuit. Evident by the number of pronouncements issued, international political bodies (such as the United Nations, European Community and the Organisation for Economic Cooperation and Development) and international private standard-setting bodies (such as the International Accounting Standards Committee), have contributed significant resources towards improving the comparability of both the measurement and disclosure of

accounting information. A variety of other institutions such as worldwide banks, labour unions, accounting firms and auditing firms can benefit from harmonised accounting practices through reduced information costs.

With respect to the factors favouring and obstructing harmonisation, Nobes and Parker (1991) and Radebaugh and Gray (1993) provide comprehensive discussions of the environmental factors that influence a nation's accounting system. Theoretically, environmental differences should cause accounting systems to differ while environmental likenesses should cause them to be similar. However, it is difficult to determine a priori which similarities represent the most favourable environment and which differences represent the largest obstacles for harmonisation.

The primary purpose of this paper addresses the third question: To what extent are current accounting practices harmonised? Specifically, we determine the extent of harmonisation of selected measurement practices (as opposed to disclosure practices or extant measurement and disclosure regulations) for companies within the EC. The EC was chosen because it provides a particularly interesting focus in the study of accounting harmonisation. Initiated by the Treaty of Rome (1957), the EC was established to provide for the free movement of persons, goods, services and capital among member countries.

Harmonisation of accounting practices is thought to be a major means to achieving a single common market. Whereas other regional and international bodies are only able to recommend or suggest international accounting standards, the EC requires member states to incorporate directives into national law. Many of the EC's member states are major industrialised countries with

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well-established capital markets. Yet, the cultures of these countries are quite distinct. The outcome of the EC's harmonisation effort provides direction for the extent to which harmonisation is possible and the most effective strategy with which to proceed to harmonise accounting practices in other regions and around the world.

Defining harmonisation is not a simple task. The definitions used in prior research studies have varied. Therefore, for the purpose of this paper, harmonisation is concurrently defined in two ways. First, harmonisation is defined as the similarity in the frequency of accounting policy choices across countries. That is, harmonisation is achieved when the companies in each country select accounting policies with the same frequency. This type of *de facto* harmonisation will be measured using the chi-square test of independence. Second, harmonisation is defined as the extent of concentration around a particular accounting policy choice. The degree of harmonisation increases as the number of companies selecting the same accounting policy increases. This type of *de facto* harmonisation will be measured using a concentration index developed by Van der Tas (1988). While the second definition is the more strict of the two, an analysis of this study's results indicates little difference between the two definitions.

The remainder of this paper is organised as follows. The second section presents the contributions and improvements of this paper in relation to prior research. The third section discusses research methodology, including data selection, statistical analysis, measurement practices examined and a statement of the hypotheses, and section four provides an analysis of the results by measurement practice. Finally, the fifth section concludes with a summary of the findings, limitations and possibilities for future research.

Contributions and improvements

Many research studies examining the extent of harmonisation fall short in one or more of the following areas: distinction between measurement and disclosure issues; data selection; statistical tests of significance; and measurement of harmonisation.

The remainder of this section addresses each of these areas.

Distinction Between Measurement and Disclosure Issues

Research studies attempting to determine the extent of harmonisation frequently combine accounting measurement and disclosure issues without distinguishing between them (e.g., Nair and Frank, 1981; Choi and Bavishi, 1982; Evans and Taylor, 1982; McKinnon and Janell, 1984; and Purvis 1991). While the results are often shown according to accounting practice or standard, the

extent of harmonisation is determined based on measurement and disclosure practices combined. The importance of distinguishing between the two is evident in a study by Hussein (1992). Comparing only two countries, the Netherlands and the US, Hussein found that measurement practices were harmonised but disclosure practices were not. The similarities of the markets and stock exchanges between the two countries were cited as the likely reason for measurement harmonisation, and differences in culture were given as the likely reason for lack of disclosure harmonisation. Thus, by clearly distinguishing measurement and disclosure issues, a greater understanding of the factors that have been the most conducive or obstructive to harmonisation of accounting practices can be obtained. This study will concentrate exclusively on measurement issues.

Data Selection

This study examines actual annual reports whereas many past studies in this area have employed survey data (e.g., Nair and Frank, 1981; McKinnon and Janell, 1984; Douppnik and Taylor, 1985; and Purvis 1991). One benefit of using survey data is that the tedious and time-consuming work of data collection is minimised. Also, several countries and practices can be examined since the data collection stage of the research project is practically eliminated. However, Nobes (1981) discusses some of the inherent limitations of using survey data when examining accounting practices. First, survey data may contain errors. Nobes illustrates numerous errors in the Price Waterhouse survey data, commonly used in classification and harmonisation studies.¹ Second, some answers, although strictly true, can be misleading, if taken out of the context of the survey. For instance, survey response in the Price Waterhouse survey data gives the impression that accounting in the UK and in Germany is equally conservative since both countries report similar scores for conservatism. However, the results fail to consider that the German definition of conservatism differs significantly from that in the UK. Finally, Nobes points out that in order to present data from surveys in an objective format, subjective choice must be made by the compilers of the survey data. Often, the compilers, staff accountants in the case of the Price Waterhouse survey data, have a different purpose in mind than do researchers who might use the data, resulting in potential measurement error from the standpoint of the researcher.

¹Price Waterhouse collected data of accounting principles and reporting practices in various countries in 1973, 1975 and 1979. The 1973, 1975 and 1979 surveys included 33, 46 and 64 countries, respectively, and covered 233, 264 and 267 accounting practices, respectively.

Tay and Parker (1990) distinguish between *de jure* harmonisation (rules, standards, etc.) and *de facto* harmonisation (corporate financial reporting practices). It is possible to have one of these two forms of harmonisation without the other. This study tests *de facto* harmonisation in contrast to the majority of studies examining *de jure* harmonisation. We agree with Tay and Parker (1990, pp. 84–85):

'If harmonisation activities are the result of concern about the comparability of accounts produced by companies from different countries, then a measurement study should focus on actual reporting practices rather than regulations, that is, on *de facto* rather than *de jure* harmonisation. Actual reporting practices may be assessed most accurately from annual accounts, or detailed surveys of such accounts.'

A research project should clearly distinguish between whether it is measuring harmonisation of accounting standards or harmonisation of accounting practices. For example, the 1973 Price Waterhouse survey data is categorised as (1) required, (2) majority, (3) about half, (4) minority, (5) no application, and (6) not permitted.² Note that categories 1 and 6 refer to standards whereas categories 2, 3, 4 and 5 refer to practices. The fact that a particular practice is required by a professional standard does not necessarily indicate that it is practised by all companies. Meek and Saudagaran (1990, p. 147) point out that 'penalties for non-compliance with official accounting pronouncements are weak or ineffective in many countries. Examining only the required standards can result in a misleading picture of actual accounting practices in a country'.

Emenyonu and Gray (1992) examine the harmonisation of measurement practices in France, Germany and the UK, based on 1989 annual reports from 26 major companies located in each of the three countries. They find significant differences in the measurement practices of inventory valuation, depreciation, goodwill, fixed asset valuation and extraordinary items. Our study builds upon Emenyonu and Gray (1992) in the following ways: First, this study includes the reporting practices of companies from Belgium, Denmark, Ireland, the Netherlands and Portugal, in addition to France, Germany and the UK. Second, this study examines the measurement practices for foreign currency translation, inventory costing methods

and accounting for research and development, in addition to the practices examined in Emenyonu and Gray.³ Finally, this study examines the 1992/93 annual reports in contrast to the 1989 annual reports used in Emenyonu and Gray. This allows for a comparison of reporting practices in France, Germany and the UK over time. Differences in results between this study and Emenyonu and Gray are addressed in the relevant portions of the analysis section.

Statistical Tests of Significance

With the exception of Emenyonu and Gray (1992), past research studies have not employed a statistical test of significance when determining the degree of harmonisation across countries (e.g., Choi and Bavishi, 1982; Evans and Taylor, 1982; McKinnon and Janell, 1984; Doupnik and Taylor, 1985; and Freedman and Stagliano, 1992), relying simply on interpretations of means, percentages and ratios. The difference in the level of harmonisation across countries will be tested for statistical significance with the non-parametric chi-square test of independence.

Measurement of Harmonisation

The majority of the past research studies have not computed a single, objective measure of harmonisation (e.g., Choi and Bavishi, 1982; Evans and Taylor, 1982; McKinnon and Janell, 1984; and Freedman and Stagliano, 1992), instead they have relied primarily on descriptive statistics. Without a single measure on which to judge the level of harmonisation, the results tend to rely heavily on the researcher's interpretation as to the extent of harmonisation. Not until Van der Tas (1988) was a single, quantifiable measure proposed to assess international harmonisation, the *I* index. The *I* index will be used to determine the extent to which companies within EC countries concentrate around a particular accounting method.

Research methodology

Data

The data used in this study are from the most recent annual reports available at the time of collection (1992/93 year ends). Based on the information in *Europe's 15,000 Largest Companies* (1992), letters written in English requesting the most recent annual report were sent to the 65 largest companies, excluding financial institutions and insurance companies, from 10 of the 12 EC member nations. Greece and Luxembourg were excluded from the mailing as neither country had 65 companies large enough to be listed in our data source. Italy and Spain were subsequently excluded from the study as less than 10 serviceable annual reports were received from each of these two countries.

²The 1975 and 1979 Price Waterhouse surveys employed a similar format for classifying accounting practices.

³Emenyonu and Gray initially examined research and development but were unable to present results due to the lack of disclosure by companies, resulting in sample sizes too small for purposes of statistical tests.

This study examines the largest companies located in each country since accounting harmonisation is an especially important issue for large multinationals. Large firms are more likely to be listed on foreign stock exchanges and to attract the interest of international investors. The likelihood of response should also increase by sampling large multinationals. Sample selection was based on firm size (total sales), not industry code. However, a review of the final sample of firms does not reveal any particular industry bias by country.

Response to the original mailing request varied by country. Companies from the Netherlands and the UK provided the best response. Second requests were sent to non-responders in Belgium, Denmark, France, Germany, Ireland and Portugal eight weeks subsequent to the initial requests. The final sample includes 30 corporate annual reports from Denmark, France, Germany, Netherlands and the UK, 23 from Belgium, 24 from Ireland and 20 from Portugal, for a total sample size of 217 annual reports from eight of the 12 EC countries.

With the exception of Belgium and Portugal, all annual reports were English versions. Six of the 23 reports from Belgium were translated from French and 11 of the 20 reports from Portugal were translated from Portuguese with the aid of an interpreter. A comparison of the English reports and the domestic language reports for both Belgium and Portugal revealed no significant differences in reporting practices. Additionally, in cases where both an English and a domestic language report were received from a company, no differences were found for the six measurement practices examined.

Statistical Analysis

The general hypothesis of harmonisation is tested using the chi-square statistic. By comparing observed frequencies against expected frequencies, the chi-square statistic tests for the equality of the proportions of accounting measurement policy choices across countries. The computed test statistic is compared to the 0.01 critical value to determine whether the null hypothesis is rejected. Failure to reject the null hypothesis suggests harmonisation of accounting measurement practices and rejection of the null hypothesis suggests a lack of harmonisation of accounting measurement practices.

When employing the chi-square statistic, Cochran (1952) suggests that when 20% of the expected cell frequencies are less than five or when any one expected cell frequency is less than one, then the computed test statistic may be inflated, possibly resulting in inappropriate conclusions. To control for the inflation caused by small expected frequencies, this paper employs a commonly used method to adjust the computed test statistics. If either of the two conditions mentioned by Cochran exists, the chi-square statistic can be approximated

by averaging the contributions of individual cells that have expected cell frequency of greater than five and then multiplying by the total number of cells. The resulting test statistic has an approximate chi-square distribution.

Van der Tas (1988) uses a Herfindahl concentration index (*H* index) to measure the harmonisation of an accounting method within a country. The *H* index is computed as:

$$H = \sum_{m=1}^M p_m^2$$

where:

H = Herfindahl index.

m = alternative accounting method *m*.

p_m = relative frequency of accounting method *m*.

Van der Tas (1988) devises two variants of the *H* index; the *C* index and the *I* index. The *C* index measures national harmonisation when a company provides information for several alternative methods of a particular accounting practice. The *I* index measures international harmonisation, i.e., harmonisation of accounting practices among two or more countries. The *I* index is computed as:

$$I = \left[\sum_{m=1}^M \left(\prod_{n=1}^N p_{m,n} \right) \right]^{\frac{1}{(N-1)}}$$

where:

I = *I* index.

m = alternative accounting method *m*.

n = country *n*.

p_{m,n} = relative frequency of accounting method *m* in country *n*.

The *I* index is computed by multiplying across countries the proportion of companies practising a particular accounting alternative and then summing over all alternative practices. The correction factor in the exponent is used when more than two countries are examined. The *I* index is not meant to give an indication of the statistical significance of harmonisation, but rather a scale upon which to quantify harmonisation for comparative purposes.

Although the *I* index is a direct variant of the *H* index, it falls short in one particular area. The *H* index ranges from 1 (all companies using the same method) to 1/*M* (companies are proportioned evenly over *M* alternative methods). Therefore, the *H* index approaches 0 as the number of alternative methods all with the same frequency approaches infinity. The *I* index also ranges from 0 to 1 but, due to the multiplication involved, the *I* index is sensitive to zero proportions. The potential sensitivity increases as the number of countries surveyed increases. To control for this sensitivity, this paper employs a simple modification to the *I* index. In cases where all of the companies in a particular country chose one of the two alternative methods, the proportions are recorded as 0.99 for the

Figure 1
Comparison of the Unadjusted and Adjusted *I* Index for Each of the Three Scenarios

						Unadjusted <i>I</i> index	Adjusted <i>I</i> index
Scenario 1:							
	<i>Country</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>		
Method	A	20	20	0	0	0 ¹	0.0581 ²
	B	0	0	20	20		
Scenario 2:							
	<i>Country</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>		
Method	A	20	20	10	0	0	0.1704
	B	0	0	10	20		
Scenario 3:							
	<i>Country</i>	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>		
Method	A	20	20	20	0	0	0.2133
	B	0	0	0	20		

¹For scenario 1, Unadjusted $I = [(1 \times 1 \times 0 \times 0) + (0 \times 0 \times 1 \times 1)]^{1/3} = 0$

²For scenario 1, Adjusted $I = [(0.99 \times 0.99 \times 0.01 \times 0.01) + (0.01 \times 0.01 \times 0.99 \times 0.99)]^{1/3} = 0.0581$

unanimous method and 0.01 for the non-practised method (instead of 1 and 0, respectively). The following illustration will demonstrate this point.

There are three scenarios with a sample of 20 companies from each of four countries. Each company may select accounting method A or B. In the first scenario, all of the companies in countries 1 and 2 select method A and all of the companies in countries 3 and 4 select method B. In the second scenario, half of the companies in country 3 switch from method B to method A. In the third scenario, all of the companies in country 3 select method A. From this, one would intuitively conclude that, going from scenario 1 to scenario 2 to scenario 3, harmonisation is increasing among the countries (i.e., a greater number of firms are choosing method A). However, use of the *I* index to measure harmonisation would not indicate this. The illustrations in Figure 1 compare the unadjusted and adjusted *I* index for each of the three scenarios.

Due to at least one zero existing in each row, the unadjusted *I* indices will be 0 for each of the three scenarios, indicating absolutely no harmonisation among the four countries. This does not seem reasonable from observation of the data since the number of firms choosing the same accounting method is increasing. Furthermore, the index is computed to be 0 even though as many as 75% of all companies choose method A (scenario 3). After adjusting the *I* index to account for the zeros, a more realistic measure of harmonisation among the four countries is given for each of the three scenarios. The adjusted *I* index increases, correctly indicating that the level of harmonisation increases as the number of companies clustering around method A increases.

As mentioned earlier, the chi-square statistic measures a different definition of harmonisation

than does the *I* index. The chi-square statistic tests for equal proportions across countries and renders the power of statistics to determine significant differences. The *I* index measures the more intuitive definition of harmonisation but provides no test for statistical significance.⁴

Measurement Practices

Measurement practices must meet two criteria for inclusion in this study. First, the policy choices must significantly affect measures of net assets and/or profits. Second, the annual reports must contain sufficient disclosure to determine the policy choice selected. Potential measurement practices to be examined include fixed asset valuation, research and development, inventory valuation, inventory costing, investments, depreciation, deferred tax, extraordinary items, pensions, consolidations, goodwill and foreign currency translation. Van der Tas (1992) extensively measures the degree of harmonisation of deferred taxes in the EC. He finds that harmonisation of accounting for deferred taxes has improved over time. Investments, leases, pensions and consolidations are excluded from this study due to the more varied and complex wording of these disclosures as well as the difficulty of fitting these measurement practices into distinct categories.

⁴The possibility of confounding results may arise. That is, the *I* index could suggest a high level of harmonisation while the chi-square test statistic could concurrently reject this notion, and vice versa. However, this limitation does not seem to affect the results of this study. The Spearman rank correlation computed between the chi-square test statistics and the *I* indices across all accounting measurement issues resulted in a correlation coefficient of -0.7333 which is significantly different from 0 at the 0.05 significance level, but is not significantly different from -1 . This indicates that high *I* indices are appropriately associated with low values of the chi-square test statistic.

Extraordinary items were originally examined, but later dropped due to the lack of a consistent definition of extraordinary items across countries and limited disclosure of the practice used in recording them. Inventory costing methods are combined with inventory valuation methods as the former represent a subset of the latter. Therefore, the six measurement practices selected for examination are fixed asset valuation, depreciation, goodwill, research and development, inventory, and foreign currency translation.

Hypothesis

Adopted by the EC Council of Ministers on 25 July 1978, the Fourth Directive outlines the formats of financial statements and rules of accounting. It aims to expedite the harmonisation of financial accounting practices. However, agreement on the Fourth Directive involved a long and difficult process. Radebaugh and Gray (1993, p. 148) conclude: 'The result of the Fourth Directive was a compromise between the continental European and the Anglo-Saxon systems with the emphasis more on disclosing the nature and effect of differences between countries.' It resulted in more of a disclosure document than a change in accounting measurement practices. While the Fourth Directive may have changed the status of measurement practices (e.g., in the UK they are now part of company law), financial statement users are ultimately concerned with companies' actual accounting measurement policy choices. The general hypothesis to be tested is stated below in the alternative form.

H_A: There are differences in the frequency of accounting measurement policy choices across the eight EC countries examined.

This hypothesis is tested by individually examining the accounting policy choices for fixed asset valuation, depreciation, goodwill, research and development costs, inventory, and foreign currency translation. Accounting for inventory consists of the valuation basis and the cost flow assumption for inventory. Accounting for foreign currency translation includes the translation of balance

sheet items, translation of income statement items and the treatment of translation gains and losses.

Analysis of results

For each of the six measurement practices examined in this study, a discussion of the provisions under the EC Fourth Directive will be provided along with an analysis of the results, statistical tests and conclusions. Tables, summarising the results for each measurement practice, are located within each section. The categories of alternative accounting methods listed in the tables are based on the actual wording of the annual reports. A non-disclosure category is included for research and development, goodwill, inventory costing and foreign currency translation. Non-disclosure may simply signify that the particular accounting policy is not relevant (e.g. no research and development costs). In other cases, non-disclosure signifies that the company is not willing to reveal this information. Since most of the EC countries allow more than one alternative for each accounting policy choice, it is impossible to infer which accounting method the non-disclosing firm selects. As a result, the non-disclosure category is reported but excluded for the purposes of statistical tests and computation of *I* indices.

Fixed Asset Valuation

The standard valuation principle under the Fourth Directive is historical cost. Article 33 allows member states to use periodic revaluations, replacement values and valuation methods that consider the effects of inflation. The Fourth Directive requires the disclosure of valuations that are determined by tax rules rather than by commercial or company law provisions.

Table 1 summarises the results by country relating to fixed asset valuation. Germany is the only country where all sampled companies used strict historical cost. German law does not allow for the use of periodic revaluations. In France, fixed assets were revalued in 1978 at 1976 values. However, the majority of French companies disclose the use of historical cost to value fixed assets. Ireland and the

Table 1

Fixed Asset Valuation

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Historical cost	19	12	24	30	5	24	0	9	123
Modified historical	4	18	6	0	19	6	20	21	94
	23	30	30	30	24	30	20	30	217

$\chi^2 = 93.34$, p -value = 0.0001, *I* index = 0.2852

UK allow periodic revaluations on an ad hoc basis. In the Netherlands, often recognised for their use of replacement cost, only one company discloses replacement cost as the primary basis of fixed asset valuation. This company is included in the modified historical cost category. All Portuguese companies disclose the use of periodic revaluations. Based on the chi-square test statistic, we conclude that there is a significant difference in the fixed asset valuation methods chosen by large companies from the eight EC countries examined.

Depreciation Methods

The Fourth Directive has a flexible depreciation policy requirement as it does not specify the use of any particular depreciation method. Rather, straight-line, declining balance, or a combination of the two methods is allowed. Tax rules play an important role in the depreciation policy of some European countries. In countries such as Ireland, the Netherlands and the UK, depreciation for financial reporting purposes is separate from depreciation for tax purposes. In contrast, depreciation in Germany is very similar for financial reporting and tax purposes. It is common practice in Germany to use a declining balance method and then switch to the straight-line method in the later years of a fixed asset's useful life in order to obtain the maximum possible tax benefits.

Table 2 summarises the results regarding the depreciation methods used. With the exception of Germany, the vast majority of large EC companies use straight-line depreciation. Only two companies, both located in Denmark, strictly use declining balance methods. These two companies are included with the 39 companies disclosing the use of both straight-line and declining balance methods. The chi-square statistic is significant, due almost exclusively to the practice of Germany. We conclude that there is a significant difference in the depreciation methods used by large companies from the eight EC countries.

Examining only France, Germany and the UK, Emenyonu and Gray (1992) report an *I* index for

depreciation methods of only 0.0076. Our results for these three countries represent an *I* index of 0.2417. However, the *I* index of 0.6245 for all eight countries is much higher, reflecting the fact that Germany appears to be a lone outlier in the consistent use of declining balance methods among EC countries. A subsequent analysis made without Germany reveals an insignificant chi-square test statistic and an *I* index of 0.9067 among the seven remaining countries.

Goodwill

Article 37 of the Fourth Directive permits goodwill, to the extent that it was acquired for valuable consideration, to be capitalised as an intangible asset on the balance sheet or to be immediately written off against reserves. If capitalised, goodwill should normally be written off over a maximum of five years. However, Article 37 allows companies to amortise purchased goodwill systematically over a period of time exceeding five years provided that this period does not exceed the useful economic life of the asset and is disclosed in the footnotes to the financial statements.

Table 3 provides a summary of the reporting practices for purchased goodwill by country. The split between those companies capitalising goodwill and those companies writing off goodwill immediately to reserves is approximately equal. Belgium, France, Germany and Portugal favour capitalisation of goodwill, whereas Denmark, Ireland, the Netherlands and the UK prefer immediate write-off of purchased goodwill against reserves. Based on the chi-square test statistic, we conclude that a significant difference exists for the recording of purchased goodwill by large companies from the eight EC countries examined. The *I* index reflects a low degree of harmonisation for this accounting policy.

The results are consistent with those reported in Emenyonu and Gray (1992) with the exception of Germany. Emenyonu and Gray in their examination of 1989 annual reports found a higher percentage of German firms writing off purchased

Table 2
Depreciation

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Straight-line	17	28	26	2	23	30	20	30	176
Straight-line and declining balance	6	2	4	28	1	0	0	0	41
	23	30	30	30	24	30	20	30	217

$X^2 = 134.82$, $p\text{-value} = 0.0001$, $I\text{ index} = 0.6245$

Germany excluded:

$X^2 = 2.94$, $p\text{-value} = 0.8158$, $I\text{ index} = 0.9067$

Table 3**Goodwill**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Write-off	0	18	0	9	17	25	0	29	98
Capitalise	20	5	30	20	3	2	8	1	89
Not disclosed	3	7	0	1	4	3	12	0	30
	23	30	30	30	24	30	20	30	217

$X^2 = 124.90$, $p\text{-value} = 0.0001$, $I\text{ index} = 0.2457$

goodwill directly to reserves, whereas this analysis found a higher percentage of German firms capitalising purchased goodwill. German firms were not required to apply the Accounting Directives Law, which governs the treatment of goodwill in Germany, until fiscal years ending *after* 1989, which may explain the change in the German practice.

Research and Development

Similar to the case for goodwill, Article 37 of the Fourth Directive is flexible in the recording of research and development costs. Companies may capitalise the costs of research and development as an intangible asset and amortise this cost over future years, or they may record the cost immediately as an expense in the income statement. If capitalised, the costs should normally be written off over a maximum of five years. However, similar to purchased goodwill, a longer amortisation period is allowed under Article 37, provided that this longer amortisation period is disclosed in the footnotes to the financial statements.

The reporting practices for research and development costs by country are given in Table 4. Almost 50% of all companies examined failed to disclose their method of recording research and development costs. As pointed out by Tonkin (1989, p. 18), 'this lack of disclosure is especially discouraging considering the size and importance that research and development costs can have on a company's

operations'. The majority of the disclosing companies record research and development costs as an expense in the income statement. In contrast, companies from Belgium and Portugal favour capitalising research and development costs. The chi-square test statistic is significant and we conclude that there is a significant difference in the recording of research and development costs by large companies from the eight EC countries examined. The *I* index indicates a higher degree of harmonisation for research and development than for fixed asset valuation or goodwill, but a lower degree of harmonisation than for depreciation. When Belgium and Portugal are excluded, the chi-square test statistic and the *I* index indicate a high degree of harmonisation among the remaining six countries.

Inventory

Article 39 of the EC Fourth Directive states that current assets should be valued at the lower of purchase price, productive cost, or market value. If current assets are adjusted for taxation purposes alone, the amount of the adjustments and the reasons for making them must be disclosed.

The categorisation of inventory valuation methods is based on the stated accounting policies of the reporting firms. In the EC, market generally means net realisable value. However, we did note two exceptions in France. These two companies, likely influenced by US accounting principles,

Table 4**Research and Development**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Expense	4	15	19	3	10	9	0	25	85
Capitalise	9	0	0	0	0	4	10	1	24
Not disclosed	10	15	11	27	14	17	10	4	108
	23	30	30	30	24	30	20	30	217

$X^2 = 38.76$, $p\text{-value} = 0.0001$, $I\text{ index} = 0.4105$

Belgium and Portugal excluded:

$X^2 = 2.47$, $p\text{-value} = 0.7814$, $I\text{ index} = 0.9381$

Table 5a**Inventory Valuation**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Lower cost/market	22	26	29	30	24	17	7	30	185
Cost	1	4	1	0	0	8	13	0	27
Market	0	0	0	0	0	5	0	0	5
	23	30	30	30	24	30	20	30	217

$\chi^2 = 17.89$, p -value = 0.0127, I index = 0.7943

defined market as replacement cost rather than net realisable value in recording inventories at the lower of cost or market.

Table 5a demonstrates that the majority (87.5%) of EC companies value inventories at the lower of cost or market. In contrast, approximately two thirds of the companies from Portugal report strict historical cost, while on third report the use of lower of cost or market. In the Netherlands, eight companies use strict historical cost, while five companies report the valuation of inventories at market values. These five companies are combined with those reporting lower of cost or market for the purpose of statistical tests. The chi-square test statistic is not significant and we conclude that there is no significant difference in the valuation methods selected by large companies in the eight countries examined. The I index indicates a greater degree of harmonisation for inventory valuation than for any of the measurement practices discussed previously. The results are consistent with Emenyonu and Gray with the exception of France.

Inventory costing methods are a subset of inventory valuation methods. Article 40 of the Fourth Directive is flexible as to the method of computing inventory cost. Cost can be calculated by the weighted average method, the 'first in, first out' (FIFO) method, the 'last in, first out' (LIFO) method, or some similar method. Many companies use a combination of these methods, applying

different cost methods to different categories of inventory.

Referring to Table 5b, the diversity of practice for inventory costing methods is quite evident. Additionally, the low level of disclosure (less than 60%) is disappointing. Tonkin (1989, p. 18) summarises the situation well:

'The low level of policy disclosures, coupled with the inherent variability in measurement practices used when accounting for inventories represents yet another information inefficiency within the international capital markets.'

Companies disclosing a combination of costing methods are classified as FIFO, LIFO, or average cost based on the dominant method used. If a dominant method is not clearly evident, companies are classified in the combined category. The combined category is deleted for purposes of statistical tests. Based on the chi-square test statistic, we conclude that significant differences exist among the inventory costing methods used by large companies from the eight EC countries examined. The I index also signifies a low level of harmonisation.

Foreign Currency Translation

EC directives provide little guidance in the area of foreign currency translation. The Seventh Directive on consolidated accounts refers to translation methods only in the requirement that the

Table 5b**Inventory Costing**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
FIFO	2	9	5	0	8	9	2	7	42
LIFO	6	0	2	15	0	1	0	0	24
Average	8	2	11	3	0	0	9	2	35
Combination	3	1	6	1	0	1	8	3	23
Not disclosed	4	18	6	11	16	19	1	18	93
	23	30	30	30	24	30	20	30	217

$\chi^2 = 71.88$, p -value = 0.0001, I index = 0.2295

Table 6a**Foreign Currency Translation of Assets and Liabilities**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Current	17	21	30	19	21	27	9	29	173
Current/historical	3	0	0	11	0	1	0	0	15
Not disclosed	3	9	0	0	3	2	11	1	29
	23	30	30	30	24	30	20	30	217

$\chi^2 = 7.22$, p -value = 0.4062, I index = 0.9040

Table 6b**Foreign Currency Translation of Revenues and Expenses**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Average/actual	20	4	29	24	13	18	5	26	140
Current	0	17	1	6	5	9	2	4	44
Not disclosed	3	9	0	0	6	3	12	0	33
	23	30	30	30	24	30	20	30	217

$\chi^2 = 54.39$, p -value = 0.0001, I index = 0.6433

Denmark excluded:

$\chi^2 = 5.23$, p -value = 0.5143, I index = 0.7881

Table 6c**Treatment of Translation Differences**

	<i>Belgium</i>	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Total</i>
Reserves	19	17	30	19	17	29	3	30	164
Income	0	1	0	10	2	0	2	0	15
Not disclosed	4	12	0	1	5	1	15	0	38
	23	30	30	30	24	30	20	30	217

$\chi^2 = 6.88$, p -value = 0.4416, I index = 0.8494

bases of foreign currency translation be disclosed in the notes to the accounts. Nobes and Parker (1991, p. 324) indicate that, in most of Europe, the choice of method is left to the company.

We began our examination of foreign currency translation by classifying policy choices into the current rate method, the temporal method, or other methods. However, it became evident that many companies, especially in Germany, did not consistently apply either the current rate method or the temporal method. For instance, some companies translate all assets and liabilities at current rates, consistent with the current rate method, but record the resulting translation gain or loss in the income statement, consistent with the temporal method. Therefore, a finer classification is employed, whereby the translation of balance sheet

and income statement accounts, and the treatment of translation differences are examined separately. The results are presented in the three tables above: Table 6a provides the results for the translation of foreign subsidiary assets and liabilities, Table 6b provides the results for the translation of foreign subsidiary revenue and expenses, and Table 6c provides the results for the treatment of translation differences.

Table 6a demonstrates that use of the current rate in translating all assets and liabilities is the dominant practice among major corporations in the EC. The lone exception is Germany where 11 of the 30 companies examined use a combination of current and historical rates. The chi-square test statistic is not significant and the I index demonstrates a high level of harmonisation. We

conclude that there are no significant differences in the translation of foreign subsidiary assets and liabilities.

The translation of foreign subsidiary income is not as uniform as the translation of assets and liabilities. The use of average or actual rates during the fiscal year is more common than the use of year-end rates. Denmark provides the lone exception where 80% of companies disclosing translation of foreign subsidiary income use the current (year-end) rates. The chi-square test statistic is significant and the *I*-index is much lower for the translation of income statement items than for the translation of balance sheet items. We conclude that there are significant differences in the translation of foreign subsidiary revenues and expenses. A subsequent analysis made with the exclusion of Denmark indicates that a considerable degree of harmonisation exists among the countries studied with the exception of Denmark. The recomputed chi-square test statistic is not significant and the *I* index is 0.7881.

The treatment of translation differences is surprisingly uniform. The majority of large companies in Europe report translation differences in the reserve section of the balance sheet, rather than taking translation differences to the income statement. Similar to translation of the assets and liabilities, Germany provides the lone exception by reporting translation differences in the income statement. Nevertheless, the *I* index depicts a high level of harmonisation. The chi-square test statistic is not significant and we conclude that there are no significant differences in the treatment of translation gains and losses.

Bicountry I indices

To further explore the extent of harmonisation in the EC, bicountry *I* indices are computed for all pairs of countries (28 pairs) for each measurement practice. The averages of the bicountry *I* indices over the nine measurement practices are shown in Table 7.

The UK and Ireland have the highest bicountry average *I* index of 0.8554. This would seem to indicate that, at least for the measurement practices and countries examined, the accounting practices in these two countries appear to be the most harmonised. Portugal and Germany produce the lowest bicountry average *I* index of 0.3824 indicating that the accounting systems between these two countries are the least harmonised.

It is interesting to observe the bicountry *I* indices when the eight countries are classified as either legalistic (Belgium, France, Germany and Portugal) or fairness oriented (Denmark, Ireland, the Netherlands and the UK). The bicountry *I* indices computed between the fairness oriented countries are higher than *all* of the bicountry *I* indices computed between a fairness oriented country and a legalistic country. Of the legalistic countries, France has the highest bicountry *I* indices when compared to each of the fairness oriented countries. Two reasons for this may be the adoption of Anglo-Saxon principles of consolidation by numerous French multinational companies (Nobes and Parker, 1991, p. 300) and the influence of the IASC's international accounting standards in France. While not as uniform as the fairness oriented countries, the bicountry *I* indices are generally higher between legalistic countries than between a legalistic and a fairness oriented country.

The overall averages of the bicountry *I* indices are shown in the last column of Table 7. They represent an average measure of a particular country's harmonisation with the other seven countries. Four of the five most harmonised countries are fairness oriented, with the UK being the most harmonised and Portugal being the least harmonised of the eight countries. The results of the bicountry *I* indices indicate that factors related to fairness oriented accounting systems are more conducive to harmonisation of accounting measurement practices than are factors related to legalistic accounting systems.

Table 7

Bicountry *I* Indices Averaged over the Nine Measurement Practices

	<i>Denmark</i>	<i>France</i>	<i>Germany</i>	<i>Ireland</i>	<i>Netherlands</i>	<i>Portugal</i>	<i>UK</i>	<i>Overall average^a</i>
Belgium	0.5200	0.7559	0.5963	0.5595	0.5877	0.6429	0.5940	0.6081
Denmark		0.6457	0.4940	0.7835	0.7244	0.4795	0.7733	0.6315
France			0.6403	0.6842	0.6569	0.6091	0.7114	0.6719
Germany				0.5225	0.4950	0.3824	0.5321	0.5232
Ireland					0.7600	0.4950	0.8554	0.6657
Netherlands						0.4994	0.7750	0.6426
Portugal							0.5127	0.5173
UK								0.6791

^aThis column is computed by averaging the seven bicountry *I* indices of each country.

A final analysis is done by separating the fairness oriented countries and the legalistic countries into two groups. Computing the four-country *I* indices for both groups reveals a higher level of harmonisation among fairness oriented countries. The *I* indices of the fairness oriented countries are higher in seven of the nine measurement practices. The average four-country *I* index for the fairness oriented countries is 0.7945 while for the legalistic countries it is only 0.5501.

Conclusion

This study applies statistical tests to determine the degree of harmonisation of selected accounting measurement practices among eight EC countries. The non-parametric chi-square statistic is used in determining whether the level of harmonisation for a given accounting practice is the same or different across countries. An *I* index developed by Van der Tas (1988) is used to measure the extent of harmonisation with respect to a given accounting practice and then to compare across practices. Modifications to both the chi-square statistic and the *I* index are developed in this paper to allow for small cell sizes and the 'zero effect' naturally occurring in this type of research.

A summary of the *I* index values and chi-square test statistics by measurement practice is given in Table 8. The highest degree of harmonisation is found in the areas of foreign currency translation and inventory valuation. The relatively high level of harmonisation for foreign currency translation is surprising considering that the EC's directives provide little guidance in this area. The use of lower of cost or market for inventory valuation is the predominant method in the EC. Harmonisation of depreciation methods is also very high, with the exception of the German practice of combining declining balance and straight-line methods. However, the results of this analysis also demonstrate that significant differences exist in accounting for

research and development cost, fixed assets, goodwill and inventory costing. Additionally, the lack of disclosure for certain measurement practices is disappointing. Approximately 50% of all companies examined fail to disclose their method of recording research and development costs; whereas another 40% of all companies examined fail to disclose their method of inventory costing.

Evident by the bicountry *I* indices, the UK and Ireland appear to have the most harmonised measurement practices while Germany and Portugal have the least. On a regional basis, the UK, Ireland and France appear to be more harmonised with the rest of the EC countries while Portugal and Germany seem to be the most different. The bicountry and four-country *I* indices reveal that fairness oriented countries are more harmonised than legalistic ones.

The results are subject to limitations. First, the largest companies from each country are examined. Therefore, the results may not be generalisable to the accounting practices of small and medium-sized companies from the respective eight countries. Second, as discussed in the research methodology section, we do not examine the practices of companies from Greece, Italy, Luxembourg and Spain. The results from these four countries would influence the overall impact of harmonisation in the EC. Finally, with the exception of six reports from Belgium and 11 from Portugal, all of the annual reports examined are in the English language. However, a comparison of results for companies reporting in English and companies reporting in their domestic language from both Belgium and Portugal reveal no significant differences in reporting practices between translations. In cases where both an English and a domestic language report are received from a company, no differences are found for the six measurement practices examined.

Research measuring the extent of accounting harmonisation is still in an early stage of development. Thus, numerous opportunities exist for future

Table 8

Summary of *I* Index Values and Chi-square Test Statistics

<i>Measurement practices</i>	<i>I indices</i>	<i>Chi-square test statistics</i>
1. Translation of the balance sheet	0.9040	7.22
2. Treatment of translation differences	0.8494	6.88
3. Inventory valuation	0.7943	17.89
4. Translation of the income statement	0.6433	54.39*
5. Depreciation method	0.6245	134.82*
6. Research and development	0.4105	38.76*
7. Fixed asset valuation	0.2852	93.34*
8. Goodwill	0.2457	124.90*
9. Inventory costing method	0.2292	71.88*

*significant at the 0.01 level

research. Examination of additional measurement practices such as pensions, leases, investments and/or consolidations is needed. Additionally, consideration of disclosure practices, such as segment reporting, has great potential. Practices of companies from countries attempting to enter the EC, such as Austria, Norway and Sweden, could be examined and compared to practices of companies in EC member states. For this study, harmonisation is examined by measurement practice across countries. Instead, harmonisation might be analysed by country across a large number of measurement practices. This would provide an indication of the level of national harmonisation in the EC. Harmonisation by industry is yet another area requiring further research. Finally, as the measurement of accounting harmonisation becomes further developed, the examination of changes over time and the factors causing the change in harmonisation needs to be studied.

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Recent Evidence on Australian Current Value Accounting Practices: Is the Phoenix Rising from the Ashes?

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Abstract—There has been a perceptible movement in Australian accounting regulations towards various forms of current value accounting (CVA) in the past five years. These developments could reflect changing commercial attitudes to CVA in Australia. This paper presents evidence about the acceptance of CVA based on a survey of 176 public companies in Australia. It was found that the number of companies preparing comprehensive CVA accounts for external purposes has significantly increased since 1980. Furthermore, the majority of respondents rated a valuation basis other than historical cost as having more relevance to the resource allocation decisions of various users. While it is concluded that current value research is still an important topic for research and debate, the findings indicate that corporate acceptance of CVA will be continually hampered by a number of implementation obstacles.

Introduction

The debate on current value accounting¹ (CVA) has dominated much accounting theory and professional discourse in the past 50 years (Zeff and Keller, 1985, pp. 569–599). While the impact of CVA literature on company accounting disclosure has been negligible over the years (see Frishkoff, 1982), it is noteworthy that many accounting standard-setting bodies around the world have, at some stage, adopted or experimented with some form of CVA system (see Gynther, 1982). Zeff and Keller (1985, p. 570) note that price level adjustments are a standard feature of financial reports in West Germany and Ireland, and in hyper-inflationary economies such as Mexico, Brazil, Argentina and Chile.

In 1979, the US Financial Accounting Standards Board (FASB) issued Financial Accounting Statement (SFAS) No. 33, *Financial Reports and Chang-*

ing Prices, which mandated disclosure of a mixture of current cost and constant dollar information in a supplementary form. However, in the wake of commercial opposition to CVA, the FASB withdrew the mandatory requirements of SFAS 33 in 1986. A similar situation occurred in the UK (SSAP 16) and New Zealand (SSAP 22) where CVA disclosures were initially mandated in a supplementary form. These proved unpopular and were subsequently withdrawn in 1985 and 1986 respectively (see Wong, 1988, p. 152).

Australia is one of the few countries in the world where CVA has enjoyed a rich intellectual heritage (examples include: Mathews and Grant, 1958; Chambers, 1955 and 1966; Gynther, 1966). Current value accounting has also enjoyed long-standing support from the official standard-setting body, the Australian Accounting Research Foundation (AARF) (see Stevenson, 1983). In Australia, comprehensive CVA financial disclosures are recommended, but not mandated, under the Statement of Accounting Practice 1 (SAP 1) *Current Cost Accounting*.² Consistent with international accounting requirements the statement recommends disclosure of financial statements on a predominantly replacement cost basis, either in primary or a supplementary form.

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¹Given the multiplicity of different current value systems available, it was essential, for the purposes of the present survey, to define CVA in a generic fashion. Current value accounting was defined to mean the comprehensive and periodic restatement of historical cost financial statements to some market determined value, whether this be buying prices (replacement cost) or selling prices (exit value). Constant dollar was defined to mean the comprehensive and periodic restatement of historic cost financial statements to units of current purchasing power.

²A Statement of Provisional Accounting Standards DPS 1.1, *Current Cost Accounting*, was issued by the professional bodies in 1977 and was accompanied by DPS 1.2, *Explanatory Statement: The Basis of Current Cost Accounting*. Amendments to these statements were made in 1978. In 1980 another exposure draft, ED15, *Current Cost Accounting Omnibus Exposure Draft* was issued, and suggested an expansion of the Provisional Accounting Standard. The Provisional Accounting Standard was issued as SAP 1 in November 1983 and was amended in 1989.

Evidence that Australian regulators are more avant-garde to CVA than many other countries comes from regulatory provisions over public companies. Forms of CVA information are now required in Australian accounting standards and in statutory provisions. Section 294(4) of the Corporations Law (1991) mandates that public companies revalue their non-current assets to some appraised market value at least once every three years. Companies are also encouraged to revalue their non-current assets at least once a year under the provisions of the Australian Accounting Standard AASB 1010, *Accounting for the Revaluation of Non-current Assets*. This standard was first issued in 1987 and substantially amended in 1989. These regulations have effectively usurped the conventional historical cost principle of valuing non-current assets. Between 1989 and 1993, the AARF initiated a number of controversial current value reporting regulations in Australia. Standards and exposure drafts covering superannuation plans, general insurance activities, employee entitlements, local governments, government departments and financial instruments, all require or strongly recommend the use of a specified exit value, present value or replacement cost valuation basis for assets, and in some cases liabilities.

Of interest is why a significant number of CVA regulations have emerged in the past five years. One possibility is that the numerous corporate collapses of the late 1980s and early 1990s, coupled with the worldwide economic recession, created a renewed interest in Australia on actual or 'true' economic values, particularly liquidating values, of corporate assets and liabilities. These developments could have complemented the resurging interest in the 'actual' cash flows of companies by the AARF and other regulators in Australia³ (see Lyons, 1991; Lawson, 1991). A major finding of this study is that the incidence of companies preparing CVA accounts has significantly increased since the early and mid-1980s. That is to say, even before CVA requirements have become mandatory. It is plausible that these developments resulted from the proliferation of CVA regulations issued by regulators since 1989. Because many of these regulations were highly controversial and received considerable public attention and debate (see Punia, 1993; Baxt, 1993), they could have contributed to a general diffusion of practices and ideas that might have served to 'educate' or 'inform' companies about the potential advantages of CVA. These regulations could have even convinced some companies that comprehensive mandatory

CVA requirements were becoming more and more imminent. There is also the possibility that recent CVA regulations have tended to mirror, rather than initiate, changes in accounting practice.⁴

In the light of recent developments it is considered timely to undertake a more contemporary investigation of CVA practices in Australia. This is particularly so given the paucity of Australian empirical literature on this issue.⁵ This study aims to investigate research issues relating to: attitudes to the decision-usefulness of CVA; the obstacles confronting the implementation of CVA; and the use of inflation adjusted information for internal decision-making. The remainder of the paper is organised as follows: section two presents the research questions and literature review. The third section covers the research methodology. Section four presents the results and discussion, and the fifth section puts forward a number of conclusions.

Research questions and literature review

Issue 1: Attitudes to the Decision-usefulness of CVA

This study poses the following research questions:

- Question 1.** *Are attitudes to the decision-making relevance of CVA by Australian companies generally unfavourable as the CVA literature would suggest?*
- Question 2.** *Has the number of Australian companies following SAP 1 (or employing another comprehensive CVA system) varied in the past decade, particularly during periods of high and low inflation?*
- Question 3.** *Are perceptions about the decision-making relevance of CVA an important characteristic distinguishing companies which follow SAP 1 from companies that do not?*

It is now well known that much of the empirical research of the 1970s and 1980s has generally failed to confirm the decision-making relevance of CVA information to various users, or the widespread acceptance of CVA practices and ideas by the business community (see Frishkoff, 1982). The majority of all questionnaire and interview-based

³The AARF, on behalf of the Australian Accounting Standards Board, issued a cash flow standard AASB 1026, *Statement of Cash Flows* in 1992. This standard required, inter alia, companies to prepare cash flow statements under the direct method.

⁴It is noted that this study does not empirically examine the extent to which various CVA regulations have, either directly or indirectly, resulted in a change of accounting practice, nor whether these regulations have simply mirrored, as opposed to being the cause, of these changes. These are complex issues requiring detailed research beyond the scope and purpose of the present study.

⁵The most recent survey on Australian current value practices was conducted by Ferguson and Wines in 1986.

studies, as well as capital market and behavioural studies of the 1970s and 1980s, indicate that there is little interest in or usage of this information by companies and key user groups, including financial analysts, loan officers, investors and managers (see, as examples, Morris, 1975; Stanga, 1979; Kelly-Newton, 1980; Stone, 1980; Beaver, Christie and Griffin, 1980; Ro, 1980; Watts and Zimmerman, 1980; Maskey, 1984; Archer and Steele, 1984). While issues of research design and methodology, particularly relating to capital market and behavioural research, are prevalent in many of these studies (see Beaver et al., 1980, p. 155), this evidence is persuasive. Much of this literature is well known and will not be elaborated here. However, given a number of important similarities between the present study and the work of Archer and Steele (1984), comparisons between the two studies will be made throughout the paper.⁶

Not only is this predominantly US-based literature now dated, but it fails to consider the Australian environment. This issue is considered important because, as previously stated, there has been a perceptible movement in Australian accounting regulations towards various forms of CVA in the past five years. These developments could reflect, or be reflected by, changing commercial attitudes to CVA. A fresh and more systematic investigation of CVA practices in Australia is considered essential for guiding future research and policy directions.

Question 1 is relevant for establishing any changes in commercial attitudes to CVA. It is noted that the present survey was directed at preparers, not users. Previous international literature, including Australian studies (see Parry, 1980; Ferguson and Wines, 1986) indicated negative attitudes to CVA by preparer representatives of public companies.

Question 2 relates to Question 1 insofar as changes in commercial attitudes to CVA are likely to be reflected in changes in the incidence of companies preparing comprehensive CVA reports. Any increase (decrease) in CVA usage will assist evaluation of the ongoing relevance and progress of CVA practice and research. A relevant aspect to this question is the relationship between respondent attitudes to CVA and prevailing inflation rates. Given a positive association between respondents' attitudes to CVA and prevailing inflation rates, a decline in the number of companies using CVA during periods of low inflation would be intuitively expected.

⁶While response rates were similar, the Archer and Steele survey of UK listed companies was considerably larger than our study. They reported 484 companies responding to their survey. It is noted that, in addition to differences in the survey instruments used, the Archer and Steele study explored attitudes to SSAP 16, *Current Cost Accounting*, at a time when these regulations were mandatory.

Question 3 attempts to identify any meaningful differences between companies following SAP 1 and those that do not. For example, Hancock (1992) has noted the frequent use of market valuations in the financial reports of Australian financial institutions. Among other variables investigated on this question are the focus of financial reporting responsibilities and perceptions of user needs for CVA information. It was anticipated that a company's willingness to disclose CVA accounts would be influenced by perceptions of user needs for information, hence supporting notions of the decision-making relevance of CVA.

Issue 2: The Obstacles Confronting the Implementation of CVA

The study poses the following research questions:

Question 4. *Given the findings of previous literature, are the obstacles confronting CVA in Australia both: (i) wide-ranging; and (ii) concentrated on reliability and cost/benefit considerations?*

Question 5. *Is there a relationship between respondents' ratings of the perceived obstacles of CVA and their attitudes towards the relevance of CVA and/or CVA regulations?*

The literature identifies a number of obstacles which can potentially explain why companies are so unwilling to adopt a comprehensive system of CVA. Different obstacles have been mentioned at different times and in the context of different empirical studies. These obstacles include: cost versus benefit considerations of CVA disclosures (for example, Ball and Brown, 1977; Watts and Zimmerman, 1980); concerns about the reliability or accuracy of market valuations, including auditing verification issues (examples include Ball and Brown, 1977; Backer, 1970; Standish, 1976; Stanga, 1979); the potentially detrimental affects of CVA income disclosures (see Frishkoff, 1982, p. 18); inadequate accounting skills of users to understand complex accounting information (for example, Foster, 1986); and the non-availability of exit or entry values, including specific price indexes, for certain types of assets (Frishkoff, 1982).

Reliability/verification issues and cost/benefit considerations frequently surface in the literature as more serious problems of CVA (see, as examples, Littleton, 1953, pp. 222ff; Backer, 1970; Ball and Brown, 1977; Stanga, 1979; Frishkoff, 1982; Henderson and Peirson, 1994, p. 617).

Nevertheless, nothing definite or conclusive on CVA obstacles has emerged from the literature. First, as previously mentioned, the literature is now dated and does not consider the Australian

environment. Second, the literature does not provide clear empirical evidence about which potential obstacles to CVA are more serious or problematic than others. This is needed in order to prioritise research activities and strategies needed to overcome these problems. Third, most studies have not explored the potential obstacles of CVA in a systematic fashion. Because different studies have employed different research designs and investigated different aspects of CVA (including the relevance of different valuation models), the issues raised in these studies are, to a large extent, *sui generis* to each particular study, making the results non-comparable and non-generalisable. A further study is needed to 'gather together' these various obstacles and test their applicability to the Australian reporting environment.

Question 4 investigates a wide range of potential obstacles to CVA suggested in the literature and attempts to identify those which are perceived as more significant by respondents. An extensive but piecemeal literature indicates that the potential obstacles to CVA could be wide-ranging and have serious implications to the capacity of companies to implement CVA. Question 4 examines whether the implications of this literature apply to Australian reporting entities.

Question 5 investigates further whether the various obstacles to CVA are the most significant factor explaining unfavourable attitudes to CVA by respondents. If so, a significant inverse relationship is expected between these variables.

Issue 3: Inflation Adjusted Information and Internal Decision-making

The study poses the following research question:

Question 6. *Given the findings of previous literature, do a significant number of Australian companies, particularly larger companies, use inflation adjusted information for internal decision-making?*

In contrast to external reporting issues, this study also explored internal uses of inflation adjusted information. This issue has been investigated, *inter alia*, in the studies of Seed (1981), Schwarzbach and Swanson (1981), Casey and Sandretto (1981) and Archer and Steele (1984). Some of the survey questions used in these studies were replicated in the present questionnaire. With the exception of Archer and Steele (1984), these studies confirm the relevance, albeit modest, of inflation adjusted information for certain types of internal decisions. There is presently no Australian literature which has explored the extent to which companies make inflation adjustments for internal decision-making.

The present survey did not draw a clear distinction between internal decision contexts which are likely to articulate with managerial 'double entry' produced financial and other accounts (cf. Archer and Steele, 1984). For example, the use of inflation adjustments for investment or asset purchases/sales might not articulate with specific financial accounts, internal or otherwise. It does, however, reveal whether inflation adjustments are perceived as broadly useful by companies. The purpose of examining internal decision contexts is to provide another important dimension for determining the decision-making relevance of inflation adjusted information generally, not to examine explicit linkages between internal and external financial accounts.⁷ Notwithstanding the articulation issue, if public companies do not make significant use of inflation adjusted information in their most basic and critical internal decisions, it would be markedly more difficult to justify the ongoing relevance of CVA research and policy initiatives. For instance, there could be a number of 'perception' related reasons (e.g., adverse affects on share prices) explaining why companies might resist certain forms of external disclosure. Furthermore, the relevance of external financial reports, whether historical cost or otherwise, to management and external users, is yet to be conclusively established in the empirical literature (see Griffin, 1987).

In contrast, a major conclusion of organisation literature (cf. Emmanuel, Otley and Merchant, 1991) is that companies make considerable use of their *internal* financial information systems for a wide range of decision-making and control purposes. Emmanuel et al. (1991, p.6 and p.31) observe that financial information is usually the only source of quantitative information that can combine the results of many different facets of enterprise activity. Financial and accounting information is central because it represents the only means of assessing the results of diverse activities of companies in terms of a single dimension (Emmanuel et al., 1991, p.34).⁸

If inflation adjusted information possessed a high degree of decision-making relevance, the organisation literature would predict that the information would be used, particularly by larger companies, for internal decision purposes by companies.

⁷This issue was examined by Archer and Steele (1984, pp.403-444).

⁸In fact, as noted by Caves (1980) and Emmanuel et al. (1991), organisational growth is usually accompanied by the introduction of formal financial measures and systems to guide the planning of capital investment and for monitoring the overall financial performance.

Research method

Subjects

A questionnaire was forwarded to 581 Australian public companies listed on the Australian Stock Exchange ($N =$ (approximately) 1,200). The sample was generated randomly from a database known as Sales Scan (Dun and Bradstreet, 1993). This database contains an address list of approximately 25,000 Australian companies with a sales turnover of A\$2m or greater and at least 20 employees. Respondents involved four distinct groups: financial controllers ($n = 40$); financial accountants ($n = 53$); company secretaries/directors/executive officers ($n = 41$); and accounting policy managers ($n = 40$). It is noted that henceforth 'n' refers to the number of respondents replying to a particular question. The results indicated that respondents generally had considerable financial reporting experience. The average internal and external financial reporting experience of respondents exceeded 11 years. Respondents were associated with five different industry groups: manufacturing ($n = 32$); retail/wholesaling ($n = 13$); mining ($n = 54$); banks and financial institutions ($n = 16$); and transport, communications and other ($n = 61$).

In terms of the size of respondent companies, sales turnover per annum had an average range between A\$100m and A\$300m, and total asset size had an average range between A\$31m and A\$100m. It is noted that the average figure for total assets and turnover are not presented as a single value (i.e., the arithmetic mean) because the survey instrument requested respondents to indicate the size of their companies in terms of a range of values (e.g., A\$31m–A\$100m). Respondents were not expected to know the exact turnover or total asset size of their companies, so suggesting a range of values was deemed more appropriate in the survey design.

Measure

The survey consisted of 133 questions, all of which related to the six specific research questions outlined in the second section of this paper. Most closed-ended questions were either rated on 5-point Likert attitudinal scales ranging from 'strongly agree' to 'strongly disagree', or on rating scales ranging from 'very often' to 'never'.

A covering letter accompanied the questionnaire and outlined the purpose of the research. Furthermore, given the variety of CVA models it was essential to define CVA in a generic fashion. Therefore, CVA was defined in the covering letter as the comprehensive and periodic restatement of historical cost financial statements to a market determined value, whether this be selling price (exit value) or buying prices (replacement cost). It is noted that, for the purposes of this study, CVA

practices refer to current *value* adjustments only and exclude practices based solely or exclusively on a constant dollar basis.⁹ For the purposes of this study, constant dollar adjustments are only relevant to Question 6, which concerns the internal uses of inflation information. Constant dollar was defined in the covering letter as the comprehensive and periodic restatement of historical cost financial statements into units of current purchasing power.

Reliability of measure. The homogeneity of the survey questionnaire and the degree to which all items measured one factor was established using Cronbach's alpha. When major questionnaire items were subjected to Cronbach's alpha, the standardised reliability coefficient was greater than 0.8. This very high reliability level indicates that the questionnaire was likely to have strong internal validity (Cohen et al., 1988).

Procedure and Response Rate

Questionnaires were mailed to subjects who were invited to complete and return the survey in stamped self-addressed envelopes. A response rate of 33.6% was achieved. This response rate is based on 176 returned usable surveys out of a sample of 524. The sample size was reduced to 524 from an initial 581 due to 51 wrong addresses and telephone numbers, two companies being in receivership and four companies no longer being listed.

Tests for non-response error. Non-response error was tested statistically by comparing the underlying characteristics of respondent companies with non-respondent companies. Of the non-respondent group, 50% ($n = 174$) were randomly selected and questioned by telephone on a number of survey questions. Statistically non-significant findings were observed when the respondent group was compared to the non-respondent group on the following variables: industry membership; company size (using market shares, total assets and sales turnover as independent variables);¹⁰ focus of financial reporting responsibility; attitudes to CVA disclosures; whether SAP 1 was adopted for external reporting purposes; preferred valuation bases;

⁹Constant dollar accounting was excluded from most survey questions because inclusion of this technique would have unduly complicated the survey instrument. This would have been likely to reduce its effectiveness, interpretability and response rate. There would also have been the possibility that inclusion of constant dollar adjustments would have obscured the significance of *valuation* adjustments, the primary focus of this study. Furthermore, constant dollar adjusted financial statements are not generally perceived by researchers to fall within the ambit of current value accounting systems. This technique is regarded by many to be little more than an extension of the conventional historical cost model, re-expressed in terms of current purchasing power only (see Chambers, 1966).

¹⁰The size hypothesis literature (e.g. Watts and Zimmerman, 1986) provides little indication of which of these measures is the most appropriate indicator of firm size. However, total asset size is the most commonly used measure in the literature.

and whether inflation adjustments were made for internal reporting purposes. These findings suggest that the respondent group was likely to be representative of the non-respondent group.

Study limitations. This study needs to be viewed in the light of methodological limitations. One potential concern relates to the measure. While this instrument was tested for internal validity, and pre-tested on a number of academics, particularly in terms of content and face validity, it was neither tested for construct validity nor test-retest reliability. Another concern relates to the sample. The sample size ($n = 176$) and response (33.6%) were considered adequate. In anticipation of difficulties in achieving a high response rate, a number of precautions were taken to ensure the sample was representative of the population. For instance, the initial sample ($n = 581$) drawn was larger than needed (see de Vaus, 1991, p. 73).

Results and discussion

This section of the paper presents the results on each of the research questions outlined in section two. It is noted that data were analysed using SPSS for Windows: Release 6.0 (Norusis, 1993).

Question 1. *Are attitudes to the decision-making relevance of CVA by Australian companies generally unfavourable as the CVA literature would suggest?*

Consistent with other survey results (e.g., Archer and Steele, 1984) our findings did not reveal widespread support for comprehensive CVA disclosure requirements by public companies. Approximately 16.8% of respondents ($n = 173$) indicated that company financial reports should be prepared on a comprehensive CVA basis (as opposed to the traditional historical cost basis) and/or standard-setters should mandate the adoption of a comprehensive system of CVA in a supplementary form. A majority (63.5%) of respondents disagreed or strongly disagreed that CVA disclosures should be made mandatory on public companies.

However, other aspects of the results were more supportive of CVA. For instance, most respondents did not rank historical cost highly as a preferred valuation basis for company financial reports. When respondents were asked to rank, in order of importance, a number of valuation bases in terms of their overall relevance to the resource allocation decisions of users, 71.1% ($n = 166$) of respondents supported either replacement cost, exit value or discounted cash flows. Only 22.2% ($n = 162$) of respondents supported historical cost, while constant dollar accounting was nominally supported by 3.2% of respondents ($n = 156$). Respondents were also asked to rate the relevance of current value financial reports to the resource

allocation decisions of a number of different user groups.¹¹ In contrast to previous surveys (e.g., Archer and Steele, 1984, p. 379), a great majority of respondents rated CVA reports as being 'useful or very useful' to certain users, particularly institutional investors (77.6% of respondents) and bankers (77.4% of respondents).¹² Furthermore, respondents rated CVA reports to be 'useful or very useful' to the following users: managers (56.6% of respondents); shareholders (48.2% of respondents); suppliers (14.9% of respondents); employees (9.7% of respondents); and consumers (5.5% of respondents).¹³

The results are paradoxical insofar as respondents were favourable to the decision relevance of CVA, but generally opposed to CVA disclosures. This anomaly can potentially be explained by reference to the implementation obstacles associated with CVA (see Archer and Steele, 1984, p. 385). This issue is explored in Question 4. Furthermore, these results, at least in terms of commercial attitudes to CVA, contradict previous US and UK studies which found little support for CVA by the business community in terms of its relevance to users or as a preferred measure to historical cost (see, as examples, Benston and Krasney, 1978; Garsombke, 1978; Kelly-Newton, 1980; Archer and Steele, 1984, pp. 378–381).

Question 2. *Has the number of Australian companies following SAP 1 (or employing another comprehensive CVA system) varied in the past decade, particularly during periods of high and low inflation?*

Given the pivotal importance of price variation in inflation accounting, a significant correlation between respondents' attitudes to the decision-making relevance of CVA (for external and internal reporting purposes) and prevailing inflation rates was expected.

¹¹It is noted that respondents were not specifically requested to rate a range of valuation models on this question.

¹²However, comparisons here are problematic insofar as the respondents in the Archer and Steele study were requested to compare the relevance of CVA accounts with historical cost accounts. Furthermore, it should be noted that Archer and Steele (1984, p. 385) found that, among respondents supporting CVA, CVA accounts were rated more highly than historical cost accounts for certain forms of decision-making, particularly in judging dividend paying ability; measuring economic performance; and estimating capacity to support wage claims.

¹³The mean scores (ranging from: 1 = Strongly agree, 5 = Strongly disagree) and standard deviations (in parenthesis) are as follows: institutional investors ($\bar{x} = 2.48$ (1.10), $n = 165$); bankers ($\bar{x} = 2.54$ (1.00), $n = 168$); managers ($\bar{x} = 2.79$ (1.10), $n = 168$); shareholders ($\bar{x} = 2.87$ (1.04), $n = 168$); other ($\bar{x} = 3.11$ (1.54), $n = 9$); employees ($\bar{x} = 3.53$ (0.78), $n = 167$); suppliers ($\bar{x} = 3.58$ (0.92), $n = 162$); consumers ($\bar{x} = 3.68$ (0.71), $n = 164$).

This survey was conducted when general inflation rates in Australia were under 2%. In contrast to the findings of Archer and Steele (1984, p. 368), the results suggest that the prevailing inflation rate was claimed by respondents to be a significant factor explaining attitudes to CVA.¹⁴ For instance, 71.6% ($n = 169$) of respondents either agreed or strongly agreed that the popularity of CVA for external reporting purposes is *predominantly* affected by prevailing levels of inflation. Furthermore, most respondents indicated that the annual inflation rate would have to exceed at least 6% before they would consider CVA information to be important for reporting purposes.¹⁵

A further 65.3% ($n = 167$) of respondents agreed or strongly agreed that the prevailing inflation rate was the predominant factor influencing the use of inflation adjusted information for *internal* decision-making. These results are strengthened when considering differences in the characteristics of companies that follow SAP 1 with those that do not. After applying t-tests (see Table 1 below) it was found that representatives of companies *not* following SAP 1 perceived the inflation rate to be a significant factor influencing the popularity of CVA, in contrast to those companies following SAP 1. Furthermore, Table 1 shows that respondent companies not following SAP 1 indicated that higher inflation rates need to be prevalent before CVA would be considered important for external reporting purposes. These results tend to reinforce the conclusion that a prevailing low inflation rate is potentially an important factor affecting attitudes towards the relevance of CVA reporting.

Previous Australian studies (e.g., Parry, 1980; Kelly, 1981; Ferguson and Wines, 1986) investigated the incidence of Australian companies employing a comprehensive system of CVA for external reporting when inflation rates were approximately five times higher than they were in 1992–1993.¹⁶ A representative study is Parry (1980). He reported that only 2.2% of public companies ($n = 230$) followed the CVA disclosure recommendations of DPS 1.1, *Current Cost Ac-*

counting (SAP 1's antecedent document) in either primary or supplementary form. In a later study, Ferguson and Wines (1986, p. 15) reported only 3.7% ($n = 135$) of public companies using any form of CVA reporting in their annual financial reports.

Compared to these findings the results of this study reveal that a surprisingly large number of companies, 11.9% ($n = 174$), currently implement the AARF's comprehensive current cost statement SAP 1, *Current Cost Accounting*, for external reporting purposes. A further 9.7% ($n = 175$) of companies prepare CVA financial reports for limited external financial reporting purposes (e.g., loan requests, investment decisions), but do not adopt SAP 1. In addition, 15.9% ($n = 170$) of respondents have prepared a comprehensive CVA report for external purposes at least once in the past 10 years.¹⁷

It is a difficult exercise explaining the counter-intuitive findings of a sizeable increase in the number of companies adopting CVA in times of very low inflation. However, there are some potential explanations. First, earlier Australian studies were conducted when SAP 1, and its earlier drafts, were only very recently exposed to companies. It is possible that the complex provisions of SAP 1 have taken more time than expected by regulators to be digested and assimilated into the reporting regimes of Australian companies. Earlier conclusions (e.g., Parry, 1980) that companies were ignoring CVA regulations altogether could have been too hasty.

Second, as previously mentioned, there has been an increasing push in the past five years by standard-setters and regulators to mandate the reporting of appraised values for non-current assets, and many forms of CVA for specific accounting items and industries. In addition to new regulations this potential diffusion of practices and ideas generated by regulators could have, *inter alia*, invoked changes in both attitude and accounting practice by orientating companies to the relevance of CVA generally.

¹⁴Archer and Steele (1984, p. 368) note with interest that SSAP 16 was not well received by the majority of UK companies even when inflation rates were around 18% in 1980.

¹⁵Approximately 40% ($n = 155$) of respondents stated that current value information would only become important for financial reporting purposes when annual inflation rates were between 6% and 10%. A further 24.5% ($n = 155$) of respondents stated that current value information would only be important when annual inflation rates exceeded 20% per annum. A further 14.1% ($n = 156$) of respondents stated that current value information would still be important when annual inflation rates were under 5%.

¹⁶Australia's inflation rate was around 10% in 1980 (see OECD Economic Outlook, No. 29, July 1981).

¹⁷Of this figure, 40% of respondents provided this information on the face of the financial report, while 60% of respondents provided the information in supplementary form only. Three of these companies had prepared CVA reports for over 10 years, while six companies had prepared the information between five and 10 years. Fifteen companies had prepared CVA reports for between two and five years and four companies had prepared a CVA report for only one year. In terms of the primary valuation bases used in the CVA financial report, 10 companies used predominantly selling price or exit value, six companies predominantly used discounted cash flows, while four companies used replacement cost and a further four companies used constant dollar adjustments only.

Table 1
T-tests Comparing the Characteristics of Companies Adopting SAP 1 with Companies Not Adopting SAP 1

<i>Comparisons between companies adopting SAP 1 with companies not adopting SAP 1</i>	<i>Mean scores and standard deviations* of companies which adopt SAP 1</i>	<i>Mean scores and standard deviations* of companies not adopting SAP 1</i>	<i>t</i>
Reporting responsibility: parent company	3.6000 (1.957)	3.4889 (2.132)	0.91
Reporting responsibility: shareholders	2.3500 (1.089)	2.0903 (1.037)	1.04
Reporting responsibility: bankers	3.7368 (1.046)	3.6978 (1.068)	0.15
Reporting responsibility: lenders	4.6111 (1.195)	4.3840 (1.141)	0.78
Reporting responsibility: managers	1.7000 (1.261)	1.8707 (1.284)	-0.56
Reporting responsibility: investors	4.8500 (1.496)	4.2160 (1.429)	1.83*
CVA information useful for managers	2.2000 (1.056)	2.8571 (1.085)	-2.55**
CVA information useful for bankers	1.8500 (0.587)	2.6122 (1.173)	-2.85**
CVA information useful for investors	1.6316 (0.684)	2.5793 (1.097)	-3.67****
CVA information useful for shareholders	2.5263 (0.772)	2.9054 (1.058)	-1.51
CVA information useful for employees	2.8889 (0.471)	3.6081 (0.779)	-3.83***
CVA information useful for consumers	3.1667 (0.514)	3.7448 (0.705)	-3.37***
CVA information useful for suppliers	3.5000 (0.924)	3.5850 (0.928)	-0.37
Standard-setters should make CVA disclosures mandatory	3.4000 (1.095)	3.8750 (1.118)	-1.79*
Popularity of CVA predominantly affected by inflation rate	3.5000 (1.000)	2.5987 (0.958)	3.94****

*Standard deviations in parentheses. Lower mean scores indicate higher ratings of agreement (i.e., 1 = Strongly agree, 5 = Strongly disagree).
*p < 0.1, **p < 0.05, ***p < 0.001, ****p < 0.0001.

continued

Table 1 continued

Chi Square Tests Comparing the Characteristics of Companies Adopting SAP 1 with Companies Not Adopting SAP 1

<i>Inflation rates needed before CVA disclosures considered important</i>	<i>Adopting SAP 1</i>	<i>Not adopting SAP 1</i>	X^2
	<i>%</i>	<i>SAP 1(%)</i>	
0-10%	82.4	34.8	14.3662**
11-20%	11.8	38.4	
21-40%	5.8	21.0	
<i>Industry type</i>	<i>%</i>	<i>SAP 1(%)</i>	X^2
Manufacturing	25	16.9	5.78
Retail/wholesale	10	7.1	
Mining	20	32.5	
Banking/finance	20	7.1	
Communications/transport	25	36.4	
<i>Annual sales turnover (A\$m)</i>	<i>%</i>	<i>SAP 1(%)</i>	X^2
50 or less	65	39.2	5.34
50 to 300	20	26.8	
301 to 700	5	9.8	
701 to 1000	0	4.6	
1000 or more	10	19.6	
<i>Total asset size (A\$m)</i>	<i>%</i>	<i>SAP 1(%)</i>	X^2
30 or less	30	32.5	6.44
31 to 300	55	34.4	
301 to 600	0	6.0	
601 to 900	10	5.2	
901 or more	5	21.9	
<i>Market shares</i>	<i>%</i>	<i>SAP 1(%)</i>	X^2
20% or less	57.8	53.7	3.77
21% to 40%	15.8	23.5	
41% to 60%	5.3	13.2	
61% to 80%	15.8	5.9	
81% to 100%	5.3	3.7	

**p < 0.05.

Question 3. *Are perceptions about the decision-making relevance of CVA an important characteristic distinguishing companies which follow SAP 1 from companies that do not?*

This question is an attempt to identify significant variables characterising companies that follow SAP 1 from those that do not. Table 1 above reports the means, standard deviations, t-statistics and X^2 statistics, of these comparisons.

In contrast to some of the findings of Archer and Steele (1984, p. 365), Table 1 indicates that there were no statistically significant differences between the two groups in terms of the focus of financial reporting responsibility, industry membership or

company size.¹⁸ However, significant differences were observed with respect to ratings of the perceived users of CVA financial reports. Table 1 indicates that representatives of companies adopting SAP 1 rated CVA financial reports as significantly more useful to managers, bankers, investors, employees and consumers. This result suggests that the incidence, and perhaps even the willingness, of companies to implement CVA reporting requirements is related to perceptions about the relevance of the information to users.

¹⁸Archer and Steele (1984, pp. 363ff) noted that larger companies tended to be more favourable to the mandatory requirements of SSAP 16. They also found that support for SSAP 16 was negatively correlated with certain industries (e.g., shipping and long-term contracting companies). No correlation was found between attitudes to SSAP 16 and technological stability.

Table 2
Mean Scores and Standard Deviations* on Ratings Why Current Value Reports Are Not Prepared for External Purposes

<i>Reason why current value reports are not prepared for external purposes</i>	<i>N</i>	<i>Mean score</i>
^a Insufficient companies preparing CVA accounts to allow inter-company comparisons	156	1.89 (0.67)
^b CVA information too difficult for users to interpret	158	2.09 (0.88)
^b CVA information too difficult for users to understand	158	2.10 (0.94)
^c Costs of preparing CVA information exceeds the benefits	159	2.04 (0.90)
^c Costly CVA information only useful to certain users	157	2.16 (0.87)
^c CVA only important when inflation rates are high	153	2.41 (0.98)
^d Difficulties in implementing information systems for the preparation and production of CVA information	156	2.05 (0.70)
^d CVA income figures not acceptable for taxation purposes	152	2.20 (0.94)
^d Existing CVA regulations (e.g., SAP 1) are not satisfactory	149	2.50 (0.77)
^d Too difficult to determine asset values for most types of assets	152	2.52 (1.00)
^d CVA does not adequately deal with the valuation of liabilities	151	2.54 (0.91)
^d CVA requires inflation indices that are not available for specific types of assets	152	2.69 (0.89)
^d CVA information is too subjective because it relies on estimates of asset values	158	2.06 (0.84)
^d CVA information is too difficult to audit	153	2.59 (0.99)
^d Historical cost is more reliable than CVA for decision-making	151	2.66 (1.03)
^d Auditors are generally unwilling to audit CVA accounts	151	2.77 (0.80)
^e CVA not useful for assessing managerial performance	154	2.71 (1.06)
^e CVA not useful for assessing company performance	152	2.74 (1.07)
^e CVA not useful for assessing operating performance	154	2.74 (1.09)
^f CVA lowers earnings which adversely affects share prices	149	2.87 (0.97)
^f CVA lowers earnings which affects perceptions of performance	149	2.88 (0.95)
^g CVA information results in the disclosure of sensitive commercial information to competitors	151	3.06 (0.87)

*Standard deviations in parenthesis. Lower mean scores indicate higher ratings of importance (i.e., 1 = Strongly agree; 5 = Strongly disagree). ^aComparability issues. ^bUnderstandability issues. ^cCost/benefit and relevance considerations. ^dFeasibility issues. ^eVerification and reliability issues. ^fUsefulness of CVA for performance evaluation. ^gDetrimental consequences of CVA disclosures.

Question 4. *Given the findings of previous literature, are the obstacles confronting CVA in Australia both: (i) wide ranging; and (ii) concentrated on reliability and cost/benefit considerations?*

An important part of this investigation entailed identifying and rank ordering a number of potential reasons and motivations why comprehensive CVA reports are not prepared by the majority of Australian companies. While possibilities have emerged in a rather piecemeal literature, they are yet to be investigated empirically in Australia. With few exceptions (e.g., Archer and Steele, 1984, pp. 406ff) there is no literature that has attempted to draw together a range of these obstacles and test their relevance against a particular reporting environment.¹⁹

Table 2 displays the means and standard deviations of a range of potential obstacles why companies are unwilling to prepare and disclose comprehensive CVA reports.

Many of the factors outlined in Table 2 have been extracted from the relevant literature. These factors have been grouped into like items to assist analysis. It is also acknowledged that many factors are not mutually exclusive. Furthermore, the obstacles to CVA listed in Table 2 are intended to be representative, rather than exhaustive, of the potential problems associated with the preparation and disclosure of CVA financial reports.

The results in Table 2 both confirm and extend previous research findings which have suggested wide-ranging difficulties associated with the implementation of CVA (see Frishkoff, 1982; Archer and Steele, 1984). To assist future research endeavours, it is useful to rank order the factors in Table 2. A single-factor repeated ANOVA was used to rank the different obstacles listed a–g (see Table 2). The omnibus F test was statistically significant [$F(6, 882) = 48.64, p = 0.000$]. This result indicates that the mean value for the clusters a–g in Table 2 were all statistically different from each other. For instance, post hoc testing (using paired t-tests) reveals that item a in Table 2 (insufficient companies preparing CVA accounts to allow inter-company comparisons) was rated by respondents as a more significant obstacle than all other factors. Post hoc testing (paired t-tests) further showed that understandability issues were rated as a statistically more significant obstacle than all items specified c–g in Table 2.²⁰

¹⁹While Archer and Steele explored a range of implementation issues they were mainly concerned with technical aspects of the implementation of SSAP 16.

²⁰Furthermore, cost/benefit and relevance considerations were rated as a more significant obstacle than all items listed in d–g; and feasibility issues were rated as a more significant obstacle than all items listed in c–g.

Certain conclusions can be drawn from the results reported in Table 2. First, the relatively low mean scores associated with reliability and verification issues, performance evaluation and the potentially detrimental consequences of CVA disclosures, indicate that these issues probably do not constitute a high or immediate priority for research. The result on reliability and verification issues has particular significance given the emphasis attached to these factors in the literature (see Frishkoff, 1982).

Nonetheless, there are several other obstacles that will impede the capacity of companies to implement CVA systems. The most important obstacle is related to inter-company comparisons. However, overcoming this problem is largely beyond the scope of research activity until standard-setters mandate a uniform CVA system.

The second most important obstacle reported in Table 2 is that users might not understand or possess accounting skills to interpret CVA financial reports. This was a substantive conclusion raised in much literature of the 1970s and early 1980s (see Frishkoff, 1982, p. 14). The present findings indicate that this is still a serious problem for the implementation of CVA. If the present results are a guide, internal and external users could require appropriate, and possibly extensive, training and education in the usage and interpretation of CVA information for decision-making purposes. As Sterling (1970) suggests, these issues need to be addressed with appropriate longer term educational initiatives and strategies.

The third most important problem in Table 2 relates to cost/benefit and certain relevance issues. These obstacles have been stressed by some authors (e.g., Watts and Zimmerman, 1980) to be among the most serious confronting CVA reporting. The present results corroborate this view. Conventional wisdom suggests that preparers will be reluctant to incur the costs of disclosing information to external parties, particularly if this externally packaged information is not perceived to have relevance to internal users. The implication of the finding is that researchers need to devote more attention to the internal preferences and dilemmas of preparers (supply focus), rather than concentrate exclusive attention on the information needs of external users (demand focus). It is noteworthy that the relevance of CVA reporting specifically for internal users and internal decision functions has not been extensively developed or established in the empirical literature (see Frishkoff, 1982).

The next major obstacle to CVA (see Table 2) relates to certain feasibility issues, including the availability of market values and inflation indices for certain types of assets. This result implies that researchers need to devote considerably more research attention to explaining, possibly by developing detailed guidelines, the pragmatics and

intricacies involved in the gathering and preparation of CVA information. This finding also implies that present CVA guidelines (e.g., SAP 1) and authoritative CVA texts might not be adequately addressing some of the fundamental and practical questions of implementation.

A number of independent variables were analysed against the obstacles of CVA specified in Table 2, in order to identify any meaningful systematic patterns. When the one-way ANOVA statistic and independent t-tests were applied, it was found that the various problems associated with CVA were not significantly correlated with: respondent occupation; internal and external reporting experience of respondents; the focus of financial reporting responsibility; perceived users of CVA reports; preferred valuation bases for company financial reports; industry membership; or company size. Furthermore, the rank order basis for CVA obstacles established in Table 2 did not systematically vary with any of these independent variables. These results suggest that the obstacles associated with CVA, as perceived by companies, are both pervasive and substantive, transcending industry, occupational, financial reporting and other boundaries. This reaffirms the conclusion of this study that corporate concerns with broad issues of implementation represent a serious dilemma and challenge for CVA researchers.

Question 5. *Is there a relationship between respondents' ratings of the perceived obstacles of CVA and their attitudes towards the relevance of CVA and/or CVA regulations?*

Respondent companies have identified a number of obstacles that explain why their companies do not adopt CVA for external reporting. The significance of these obstacles on survey responses was analysed further by examining any patterns between ratings of perceived obstacles and attitudes to the relevance of CVA by respondents.

It was found that attitudes to CVA were correlated with certain obstacles confronting the adoption of CVA. In the questionnaire, respondents were asked questions relating to: (a) whether they believed companies should be preparing a comprehensive set of CVA reports either in primary or a supplementary form; (b) whether standard-setters should mandate CVA disclosures; and (c) whether respondents preferred current value to historical cost as a primary valuation model for economic decision-making. All of these questions yielded statistically significant results. For example, the results (using t-tests and an alpha level of 0.05) demonstrated that respondents who did support CVA disclosures rated the obstacles to CVA as

significantly less important than companies not in favour of CVA disclosures. In particular, CVA was rated as: relatively more useful to users ($t = 3.24$); easier to interpret ($t = 2.67$); easier to understand ($t = 2.68$); perceived the relevance of CVA to be less affected by the inflation rate ($t = 2.03$); did not consider historical cost to be necessarily more reliable than market valuations ($t = 3.83$); perceived less difficulties with implementing CVA information systems ($t = 2.35$); CVA was considered relatively more useful for assessing company performance ($t = 4.85$); CVA was considered relatively more useful for assessing management performance ($t = 4.47$) and operating performance ($t = 4.41$); perceived existing CVA regulations to be satisfactory ($t = 3.64$); and were less concerned about potentially sensitive CVA disclosures ($t = 4.12$).

These results further confirm, at least on certain variables, that lack of willingness to adopt CVA is directly associated with perceptions of the implementation obstacles identified in Table 2.²¹

Question 6. *Given the findings of previous literature, do a significant number of Australian companies, particularly larger companies, use inflation adjusted information for internal decision-making?*

As mentioned previously, developments in the organisation literature (cf. Emmanuel et al., 1991) have established that companies depend heavily on their internal financial information systems for a wide range of decision-making and control activities. Whether CVA is used for internal purposes is therefore a pertinent test of the decision-making relevance of the information. Respondents were asked to rate 29 internal decision contexts in which current value or constant dollar adjustments were regularly made. Furthermore, respondents were requested to indicate whether each internal decision context was adjusted for CVA information or constant dollar information.

The frequencies, means and standard deviations of respondent ratings of each internal decision context adjusted for inflation is reported in Table 3.

According to Table 3, the two far right columns (CV% and CD%) represent the frequency of current value or constant dollar adjustments made as a proportion of the 'Very often and Often' column. Furthermore, internal decision contexts have been grouped under like items in Table 3 to assist the analysis. Compared with previous US studies (e.g.,

²¹It is noteworthy that Archer and Steele (1984, pp. 413-414) did not find a correlation between companies experiencing a greater degree of implementation difficulty with SSAP 16 and their attitudes towards compliance with the standard.

Table 3
Frequencies, Means and Standard Deviations* on Ratings of the Regularity in which Inflation Adjustments are Performed for Internal Decision-making Purposes

<i>Type of internal decision</i>	<i>N</i>	<i>Very often or often %</i>	<i>Rarely or never %</i>	<i>Mean scores</i>	<i>CV%</i>	<i>CD%</i>
^a Assessing asset replacement decisions	162	42.0	53.1	3.35 (1.46)	63.5	36.5
^a Purchase of productive assets	164	39.0	56.0	3.44 (1.45)	61.3	38.7
^a Planned sale of assets	162	36.4	57.4	3.45 (1.40)	76.8	23.2
^a Identification of operations that should be phased out in the long run	160	27.6	67.5	3.88 (1.36)	71.1	28.9
^b Forecasting of a project's future cash flows	161	42.8	54.7	3.40 (1.49)	57.8	42.2
^b Forecasting of revenue and expense projections for specific projects	161	37.9	58.4	3.53 (1.46)	51.6	48.4
^b Purchase of investments	164	37.8	54.9	3.41 (1.41)	65.2	34.8
^b Determination of the cost of capital used to discount the future cash flows of investment projects	164	34.1	60.4	3.62 (1.47)	55.4	44.6
^b Investment in other companies	161	33.6	57.8	3.53 (1.41)	71.2	28.8
^b Identification of operations where additional capital investments would be most profitable	162	31.5	63.6	3.72 (1.43)	65.1	34.9
^b Calculation of company return on investment	162	17.9	80.9	4.21 (1.27)	71.4	28.6
^c Formulation of divisional budgets	158	29.1	69.6	3.94 (1.41)	59.2	40.8
^c Comparison of actual results with budgeted results	162	8.1	91.4	4.56 (0.93)	47.1	52.9
^d Cost-volume profit analysis to determine break-even levels and required sales	159	15.1	78.6	4.26 (1.18)	71.4	28.6
^d Determination of standard costs production	159	13.2	83.0	4.38 (1.12)	63.6	36.4
^e Determination of individually negotiated selling prices	154	15.6	81.2	4.35 (1.15)	65.2	34.8
^e Determination of standard selling prices	155	14.8	81.9	4.37 (1.13)	68.2	31.8
^f Evaluation of gains or losses from inventory holding practices	159	11.3	86.8	4.36 (1.12)	84	16
^f Inventory control purposes	160	10.1	85.7	4.39 (1.08)	85.7	14.3
^g Calculation of an employee's wages	161	14.3	84.5	4.39 (1.11)	53.8	46.2
^g Calculation of key financial ratios	162	8.0	89.5	4.54 (0.93)	66.7	33.3
^g Calculation of productivity measurements	159	5.7	90.5	4.58 (0.88)	66.7	33.3
^g Determination of debt covenants and other loan agreements	161	5.0	90.0	4.62 (0.80)	66.7	33.3
^h Calculation of performance measures based on fixed assets	161	8.7	88.2	4.47 (0.99)	61.1	38.9
^h Calculation of divisional profit used to evaluate divisional performance	160	6.3	93.2	4.61 (0.88)	58.8	41.2
^h Monitoring divisional performance	161	6.2	92.5	4.58 (0.87)	62.5	37.5

continued overleaf

Table 3 continued

^b Calculation of management incentives based on performance	161	3.7	91.9	4.61 (0.84)	50	50
^c Calculation of company profits	162	8.7	91.4	4.51 (1.07)	70	30
ⁱ Determination of dividend payments	158	4.4	91.7	4.71 (0.74)	66.7	33.3

*Standard deviation in parenthesis. Lower mean scores indicate higher ratings of usage (i.e., 1 = Very often; 5 = Never). ^aAsset utilisation, acquisition and disposition. ^bCapital budgeting and investment appraisal. ^cFormulation and monitoring of budgets. ^dCost-volume profit analysis. ^eAnalysis and determination of pricing policies. ^fInventory holding and control activities. ^gOther internal decisions. ^hPerformance measurement and evaluation. ⁱDetermination of company profits and dividend payouts.

Seed, 1981), Table 3 reveals a reasonably significant use of inflation adjusted (CVA and constant dollar) information for internal decision-making. However, the results contrast sharply with Archer and Steele (1984, p. 403) who reported only 7% of companies using inflation adjustments in managerial accounting.²²

A single-factor repeated ANOVA was used to compare and rank order the various decision items adjusted for inflation in Table 3. The omnibus F test was statistically significant [$F(8, 1104) = 42.94$, $p = 0.000$]. This indicates that some decision contexts were adjusted more frequently for inflation than others. For instance, post hoc testing (using paired t-tests) revealed that inflation adjustments were made, on average, more frequently in asset utilisation, acquisition and disposition decisions than all other decision contexts listed in clusters b-i (see Table 3). Also, post hoc testing (paired t-tests) revealed that capital budgeting and investment appraisal decisions were adjusted for inflation more frequently than all other decision contexts specified in clusters c-i. Furthermore, it was found that inflation adjustments were made more often in decisions relating to the formulation and monitoring of budgets than all other decision clusters enumerated d-i.²³

²²One explanation for this finding could relate to differences in survey instruments used. In contrast to the present study, Archer and Steele explored the issue of internal inflation adjustments in the context of specific managerial accounts (e.g., managerial profit and loss accounts). As Archer and Steele (1984, pp. 397-400) observe, it is possible that companies could be impounding the effects of inflation for internal decisions by using a variety of alternative methods, rather than specific (and undoubtedly more costly) adjustments to a set of managerial accounts. Interestingly, Archer and Steele (1984, p. 400) observe that alternative adjustment methods were not used widely in the place of adjustments to managerial accounts.

²³Furthermore, post hoc testing revealed that cost-volume profit decisions were adjusted more frequently than all items listed e-i; inventory holding and control decisions more frequently than all items specified in g-h (but not for items listed under i); 'other' decision items under g more frequently than all items h-i; and more frequently in performance evaluation and measurement decisions than items under i.

It is worth noting that the majority of all inflation adjustments enumerated in Table 3 were made using a current value basis rather than in constant dollars. This evidence appears to confirm the potential relevance of inflation adjustments generally, and current value adjustments in particular, at least for certain types of internal decisions.²⁴

A number of independent variables were analysed against the decision contexts specified in Table 3 to identify any meaningful systematic patterns. When the one-way ANOVA statistic and t-tests were applied, it was found that the frequency with which internal decision contexts were adjusted for inflation correlated with certain independent variables, including company size and industry membership.

The company size variable yielded highly significant results. Larger companies, measured both in terms of total assets and sales turnover, made more frequent inflation adjustments for a wide range of internal decisions than smaller companies. Table 4 below reports the means, standard deviations and F statistics when total asset size was used as the independent variable. It is noted that total assets is the most common size measure used in the size hypothesis literature (see Watts and Zimmerman, 1986).

Companies with more than A\$300m in total assets were classified as large, and companies with less than A\$30m were classified as small, relative to the sample size.²⁵ Post hoc testing (Duncan's test)

²⁴While the US studies of Seed (1981) and Schwarzbach and Swanson (1981) reported a greater number of companies making internal adjustments for inflation, there are factors that could explain these differences. First, the inflation rate was approximately 10% in the US in 1981 (OECD Economic Outlook, 1981), whereas the present survey was conducted in a period of much lower inflation. Second, the US studies were conducted in a period when CVA was mandatory. This could have facilitated greater use of inflation adjusted information for internal purposes as the information was already being produced for external purposes.

²⁵It is noted that the average total asset size for the sample ranged between A\$30m-A\$100m.

Table 4
Means, Frequencies and Standard Deviations* of Comparisons Between Firm Size and the Regularity in which Inflation Adjustments are Performed for Internal Decision-making Purposes

<i>Type of internal decision</i>	<i>Firm size (total assets)</i>			<i>F</i>
	<i>A\$30m or less</i> <i>N = 56</i>	<i>A\$31-300m</i> <i>N = 63</i>	<i>A\$301m or more</i> <i>N = 54</i>	
Investment in other companies	4.0408 (1.322)	3.3333 (1.406)	3.2115 (1.405)	5.3065**
Purchase of investments	3.8235 (1.307)	3.2586 (1.433)	3.0962 (1.418)	3.9034**
Purchase of productive assets	3.8039 (1.357)	3.4138 (1.475)	3.0385 (1.427)	3.7242**
Assessing asset replacement decisions	3.6531 (1.363)	3.3966 (1.533)	2.9231 (1.412)	3.3557**
Planned sale of assets	3.8000 (1.262)	3.2807 (1.448)	3.2308 (1.423)	2.6576*
Evaluation of gains or losses from inventory holding practices	4.6875 (0.776)	4.1071 (1.289)	4.3269 (1.167)	3.5539**
Inventory control purposes	4.6250 (0.9368)	4.2105 (1.191)	4.3462 (1.064)	1.9745
Calculation of management incentives based on performance	4.8542 (0.412)	4.5862 (0.899)	4.4231 (1.016)	3.4190**
Calculating employees' wages	4.6458 (0.863)	4.2881 (1.218)	4.2549 (1.197)	1.8824
Monitoring divisional performance	4.8958 (0.3087)	4.5862 (0.9372)	4.2885 (1.054)	6.4170**
Calculation of divisional profit used to evaluate divisional performance	4.8333 (0.519)	4.6491 (0.876)	4.3462 (1.101)	3.9986**
Formulating divisional budgets	4.4792 (1.072)	3.5818 (1.548)	3.7692 (1.423)	5.9612**
Calculation of company profits	4.7755 (0.7435)	4.2931 (1.338)	4.4808 (0.980)	2.7328*
Calculation of company return on investment	4.6875 (0.854)	3.8983 (1.435)	4.0962 (1.302)	5.6297**
Forecasting revenue and expense projections for specific projects	4.2200 (1.234)	3.4286 (1.425)	2.9231 (1.440)	11.5427****
Forecasting a project's future cash flows	4.1837 (1.286)	3.1897 (1.407)	2.8039 (1.470)	13.0763****
Determination of cost of capital used to discount the future cash flows of investment projects	4.3200 (1.133)	3.5500 (1.419)	2.9412 (1.529)	12.7553****

continued overleaf

Table 4 continued

Identification of operations where additional capital investments would be most profitable	4.2600 (1.259)	3.6724 (1.419)	3.1765 (1.438)	7.8319***
Identification of operations that should be phased out in the long run	4.3333 (1.226)	4.0000 (1.284)	3.2745 (1.401)	8.6039***
Cost-volume profit analysis to determine break-even and required sales volume	4.6458 (0.939)	4.2632 (1.173)	3.8824 (1.306)	5.4246**
Determination of standard costs of production	4.5417 (1.031)	4.2586 (1.292)	4.3600 (1.025)	0.8284
Determination of standard selling prices	4.4375 (1.183)	4.5000 (1.112)	4.1250 (1.265)	1.4383
Determination of individually negotiated selling prices	4.5319 (1.081)	4.4286 (1.076)	4.0625 (1.278)	2.2341
Calculation of performance measures based on fixed assets	4.6531 (0.925)	4.5424 (0.837)	4.2000 (1.195)	2.8578*
Determination of dividend payments	4.8750 (0.444)	4.6607 (0.793)	4.6078 (0.896)	1.7878
Calculation of key financial ratios	4.8163 (0.601)	4.5172 (0.903)	4.2885 (1.143)	4.2179**
Comparison of actual results with budgeted results	4.7143 (0.791)	4.3793 (1.089)	4.6154 (0.844)	1.8746
Calculation of productivity measurements	4.8511 (0.551)	4.4386 (1.069)	4.4808 (0.874)	3.3377**
Determination of debt covenants and other loan agreements	4.7708 (0.660)	4.5862 (0.859)	4.5192 (0.852)	1.3131

*Standard deviations in parentheses (1 = Very often; 5 = Never). *p < 0.1, **p < 0.05, ***p < 0.001, ****p < 0.0001.

confirmed the results reported in Table 4, namely that companies with greater total assets made significantly more frequent adjustments for a wide range of internal decisions.²⁶

The size variable is particularly significant for establishing the decision-making relevance of inflation adjusted information. The organisation and control literature has established important explanatory linkages between company size and the relevance of internal financial information for decision-making and control purposes. Larger companies are characterised by, *inter alia*, a decentralised decision-making environment, disaggregation in management structures, differentiation in subunits, and bureaucratisation (Gordon and Miller, 1976, pp. 59–69). These features of organisational structure have been argued to necessitate the development and maintenance of more sophisticated internal financial systems to monitor, integrate and control a diverse range of activities within large organisations (Emmanuel et al., 1991). Given that management's reliance on internally generated financial information tends to increase as a company grows in size (see Emmanuel et al., 1991, pp. 63–64, 200ff and 278–280), this literature presents useful propositions for evaluating the relevance of CVA information. Consistent with this literature, the present results provide evidence of correlations between the regular usage of inflation adjusted accounting information and firm size.

These findings indicate that several companies perform inflation adjustments, and that the information has at least some potential decision-making relevance.

It should be noted, however, that this study makes no attempt to establish and test explicit measures of organisational complexity, nor can it be certain that the organisational features of large firm types are present in our own sample. Readers are cautioned to interpret the results in the light of this limitation.

Conclusions

While the incidence of companies disclosing CVA financial reports has increased considerably since 1980, the wider acceptance of CVA practices in Australia will be continually dogged by business concerns with its implementation.

The results indicate that companies consider comparability issues, understandability concerns, cost/benefit considerations and feasibility constraints to be among the most serious problems confronting CVA implementation. However, reliability/verifiability problems, performance evaluation

issues and the potentially detrimental consequences of CVA disclosures were not ranked as particularly significant issues by companies. These results are relevant because CVA researchers now have a more informed basis for developing longer term research and educational strategies for developing CVA policies and practices.

A number of other implications emerge from this study for the present and future direction of CVA research.

First, even in times of very low inflation, CVA research is still justified and relevant, particularly in the light of CVA practices, which, while not particularly widespread, are nevertheless present in a significant minority of cases. Furthermore, considering that most respondents stated that prevailing inflation rates are the predominant factor influencing the popularity of CVA, it is expected that an even larger number of companies will be preparing CVA reports if and when inflation rates increase.

A second implication relates to where greater research attention is needed in this field of enquiry. Much of the CVA literature to date has tended to focus on the decision relevance of different valuation philosophies, the analytical refinement of measurement techniques, and the conceptual weaknesses of conventional historical cost accounting. However, this paper concludes that more intensive systematic research efforts devoted to identifying and overcoming the implementation problems of CVA is a pressing issue for future research. This conclusion is considered particularly relevant to Australia given the dearth of available literature on this issue.

Third, over the last decade, almost no research attention has been given by Australian academics and standard-setters to monitoring the adoption of CVA practices by the business community, particularly in the context of CVA research and policy evaluation. The consequences of this deficiency are that researchers have no relevant statistics for assessing and evaluating the longer term progress of CVA, nor whether CVA practices are affected by changes in critical environmental conditions, such as prevailing inflation rates, extant CVA regulations and other commercial and economic circumstances. It is hoped that this study will encourage future investigations in order that results can be compared and evaluated over time.

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The Nature and Rationale of a Conceptual Framework for Financial Reporting by Islamic Banks

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Abstract—Islamic banks have to abide by the revealed doctrines in Islam in conducting their business and financial transactions. They employ in-house religious advisers—often referred to as *Shari'a* Supervisory Board (SSB)—who issue a special report to inform users of financial statements whether or not the bank has adhered to the Islamic principles. Recently, a private standard-setting body—the Financial Accounting Organization for Islamic Banks and Financial Institutions (FAOIBFI)—has been set up to externally regulate the financial reporting by Islamic banks. The FAOIBFI has published two statements on the objectives and concepts of financial reporting to act as a framework in setting accounting standards for Islamic banks. This paper examines the FAOIBFI's approach for developing objectives and concepts of financial accounting and investigates its need for such a theoretical framework. It is argued that the FAOIBFI's objectives and concepts would not be useful in mandating accounting standards on issues that are affected by religious ruling. This does not necessarily mean that such a framework may not be useful in legitimating the FAOIBFI's role and in setting accounting standards for issues that are not governed by revealed moral doctrines although it will be subject to similar limitations to those found by other standard-setting bodies in utilising and applying their framework. However, it implies that the more the FAOIBFI sets accounting standards that incorporate religious ruling, the less it would tend to find its own objectives and concepts useful. The ambiguities that may arise from different interpretations of the religious rules will require resolutions primarily by reference to religious rather than accounting authority.

Introduction

A number of accounting standard-setting bodies have developed a theoretical framework for financial reporting that would provide 'general underlying principles which permeate and underpin any specific transaction or chain of transactions which exists or which may be invented at a later date', and which would also reflect 'a whole spate of formal proposals from various bodies and individuals seeking to provide or move towards an all-embracing theory' (Alexander, 1990, p. 99). It is claimed that the development of such a framework would be a crucial aspect of professional self-regulation highlighting a major departure from previous low-level efforts to establish accounting

theory as a guide for practitioners in their individual decision-making capacity (Archer, 1993, p. 63).

In the US, for example, the Financial Accounting Standards Board (FASB) (1976 and following¹) has completed the basic elements of a conceptual framework (CF). Additionally, the International Accounting Standards Committee (IASC) has published its *Framework for the Preparation and Presentation of Financial Statements* (1989). In the UK, the Institute of Chartered Accountants of Scotland published *Making Corporate Reports Valuable* in 1988 and the Institute of Chartered Accountants in England and Wales published the Solomons' Report *Guidelines for Financial Reporting Standards* (1989) which was 'addressed to the Accounting Standards Committee'. Recently, the Accounting Standards Board (ASB) published as exposure draft *The Objectives of Financial Statements and the Qualitative Characteristics of Financial Information* (1991), a statement of principles which seems to be the first part of a CF. Similar efforts have also been made in Canada and Australia.

At the same time, there has been a growing appreciation of the moral considerations in business and accounting. For example, ethical funds, which attempt to introduce 'a moral as opposed to purely financial aspect to "social" investment, ... typically do not invest in companies that fail to

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¹The FASB issued five Statements of Financial Accounting Concepts. These are stated in footnote 17.

meet their social criteria, or they disinvest from companies whose activities become unacceptable... (Owen, 1990, p. 250; see also Perks et al., 1992). And in terms of research, it is observed that '[s]erious academic attention is only now beginning to be paid to the ethical problems of the public accounting profession' (Gaa, 1994, p. xii).

Such an appreciation of the importance of moral considerations (in secular societies) tends to stem from the view that

'what we seek in ethics is not simply to know what the good is, but what we are to be and to do in complex and changing situations in order to live well, to be good and just' (Schweiker, 1993, p. 239).

and that

'The universality of ethics in business [as well as in accounting] operates on the fundamental assumption that a human being has a purpose for existing, and one ought to behave in order to realise that (Nozick [1975]). Thus the search for a purpose in life involves an individual's attempt to discover a relationship between oneself and a larger social context. This extends to daily activities within the work environment where an individual strives to believe that what one is doing is worthwhile (Graham [1986])' (Ponemon and Gabhart, 1994, p. 3).

Hence, it is argued that

'what makes accounting an activity concerned with how we should live... [is] giving an account of our past actions and their consequences [usually described in a number of ways: political, economic, social, and personal], that is, of ascribing accountability *ex post facto*' (Schweiker, 1993, pp. 234, 241, emphasis in original).

This would suggest, as Gambling and Karim (1991, p. 2) note, that

'an amoral accounting code is neither essential nor desirable—and is, in fact, strictly impossible'.

'Historically, religion has played a role in enforcing ethical behaviour by invoking an omniscient being with the power to reward and punish behaviour' (Noreen, 1988, p. 368). In medieval Europe, canon law decreed that the taking and payment of interest on loans was a major sin. Commerce was seen as a matter of morality and subject to divine ordinances. However, as Tawney

(1926) observes, the development of the outwardly more rigorous definition of usury eventually led to the division of worldly and spiritual affairs thereby permitting the emergence of the modern Western capitalist society. According to Tawney (1926, p. xi, preface to 1936 edition):

“‘Trade is one thing, religion is another’: once advanced as an audacious novelty, the doctrine that religion and economic interests form two separate and co-ordinate kingdoms, of which neither, without presumption, can encroach on the other, was commonly accepted by the England of the nineteenth century with an unquestioning assurance at which its earliest exponents would have felt some embarrassment.’

Apparently, the ethics preached by the church and the reality of the marketplace were painfully at odds. As commerce grew, merchants needed more complex forms of credit and theologians began to find ways to justify the payment of interest. For example, in considering the practical accounting effects of the medieval Christian church's ban on usury, de Roover, according to Parker (1988, p. 140), claims:

'It was argued by the merchants... and accepted by most theologians, that the [bill of] exchange transaction was not a loan but either a commutation of moneys or a buying and selling of foreign currency. The exchange transaction was used to justify the credit transaction and the speculative profits on exchange to cloak the interest charges. There was, it was claimed, no usury because there was no loan.'

Such developments also seem to have shaped the way in which social sciences (including accounting and auditing) have come to be seen as objective, value-free and hence as essentially amoral disciplines in Western capitalism (Gambling and Karim, 1991).

Islam, like medieval canon law, does not recognise the separation between spiritual and temporal affairs. Commerce is seen as a matter of morality and is subject to the precepts of the *Shari'a*.² However, as Ahmad (1989, p. 24) notes, 'despite the severe condemnation of interest in Islam, the Muslim societies were unable to keep away from interest-based transactions when modern banks appeared on the scene... [apparently because of] the political and military subjugation of a large part of the Muslim world by the Western colonial powers who foisted alien financial practices on the Muslim people'. Hence, it seems that it was not until recently that Muslims have had the opportunity to conduct their banking businesses in accordance with their revealed doctrine. This was spurred on by the revival of the Islamic faith in many

²*Shari'a* is the Islamic law of human conduct which is derived from the Quran (The Muslim Holy Book) and the deeds and sayings of Prophet Mohammed.

Islamic countries and one of the major financial innovations that emerged from this resurrection is Islamic banking.³ The rapid increase in the size and number of these religious banking organisations is an indication of their growing significance as a new type of financial institution.

The *Shari'a* forms the basic ground-rules with which Islamic banks must comply in all their financial transactions. For example, Islamic banks cannot enter into any financial transaction that would result in the payment or receipt of interest as this is strictly prohibited by the *Shari'a*. However, there are different views on the effect of the prohibition of interest on such Western concepts as the time value of money. Some Muslim scholars (e.g. Abu Saud, 1976; Khan, 1986) argue that the concept of time value of money is not acceptable in Islam. Others (e.g. al Abji, 1985; al Masri, 1986) believe that since a higher deferred price of an object of sale, compared to its spot price is legitimate, it implies a recognition of the time value of money in Islam. Saadalla (1985) also identifies the acceptance of the time value of money by *Shari'a* scholars but only in relation to real transactions (see also Tomkins and Karim, 1987; al-Zarqa, 1983).

From the standpoint that does not permit the concept of time value of money, to approve of it may be little more than another way of circumventing the ban on *riba*.⁴ Parallels can be drawn with the ban of usury in medieval Europe which led merchants to invent instruments that did not appear to charge interest directly such as bills of exchange (which also seem to be closely linked to the emergence of double-entry bookkeeping (Hoskin and Macve, 1986)). Just as Christian theologians eventually found reasons to permit the charging of interest, so some Islamic scholars are gradually extending the range of transactions permitted by revealed doctrines. One of the implications of such behaviour is that it would tend to

give rise to different recognition, measurement and reporting to transactions conducted by Islamic banks.

With this background, this paper gives a brief account of the self-regulation of financial reporting by Islamic banks and examines the approach followed by the Financial Accounting Organization for Islamic Banks and Financial Institutions (FAOIBFI) in developing its objectives and concepts of financial accounting. It also investigates the FAOIBFI's need for a theoretical framework in the light of the current practices of Islamic banks which, with the help of their SSB (*Shari'a* Supervisory Board), set their own accounting policies but without reference to explicit objectives and concepts. It is argued that the FAOIBFI's objectives and concepts would not be of use in regulating those accounting issues governed by *Shari'a* rulings. Whilst a theoretical framework may be useful in regulating those issues not governed by *Shari'a* injunctions, the more the FAOIBFI sets accounting standards on issues that are affected by doctrinal ruling, the less it would tend to be able to use its own objectives and concepts.

The next section provides an overview of the establishment of the FAOIBFI to regulate the financial reporting by Islamic banks. The remainder of the paper discusses the methodology pursued by the FAOIBFI in developing its objectives and concepts of financial reporting and examines the FAOIBFI's need for a CF and the difficulties that it may encounter in using its objectives and concepts. The concluding remarks are presented in the final section.

Regulation of financial reporting by Islamic banks

At present, most Islamic banks operate in semi-regulated markets. This enables them to set their own accounting policies either on issues that are not usually addressed in the accounting standards promulgated by Western or international standard-setting bodies (e.g. the use of the *Mudaraba* contract⁵ both in the mobilisation and uses of funds) or on issues where Western or international standards do not comply with the *Shari'a* principles (e.g. Islamic banks do not report long-term receivables at their present value.⁶)

The process of accounting policy-making in Islamic banks is carried out (in most cases) with the help of the bank's SSB. The demand for the services of an SSB:

'indicates the perceived need to constantly check innovations in banking practice [as well as in accounting] against the principles of Islamic orthodoxy' (Wilson, 1985, p. 42).

³See the appendix of chapter two in Gambling and Karim (1991) for more details on the revival of Islam and modern business activity.

⁴*Riba* is translated strictly as usury, but interpreted universally as interest.

⁵This is a contract based on the combination of capital from one or more partners and work from the other party. Profit is shared by the two parties according to a predetermined percentage. However, in case of loss, the capital provider bears all risks, but not more than what has been paid, and the other party receives no return for his work. Furthermore, the capital provider(s) is not allowed to interfere in the management of the enterprise in which his funds are being used, i.e. ownership is separated from the management of the project.

⁶According to Accounting Principles Board Opinion No. 21, para. 3(a), all receivables are subject to present value measurement techniques and interest imputation, if necessary, except for normal accounts receivable due within one year and other specifically excluded types, for example, security deposits, advances, transactions between parent and subsidiary, and receivables due at some indeterminable future date.

It is not mandatory that each Islamic bank should have its own SSB. This is because an SSB is perceived as a control process developed voluntarily by Islamic banks to satisfy the moral expectations of their customers. In certain countries (e.g. United Arab Emirates and Malaysia), however, it is a legal requirement that has to be fulfilled by Islamic banks if they are to be licensed. Members of the SSB are usually appointed by a decision of the general meeting of shareholders and although their duties and responsibilities differ from one bank to another, in most banks they:

1. design and approve the bank's contracts for its basic activities and issue religious rulings in response to requests by the staff;
2. participate with the external auditor and the management of the bank in setting the bank's accounting policy on issues which are either not covered by the accounting principles enforced in the country or are in violation of the *Shari'a* (Karim, 1990a);
3. 'ensure that all bank practices conform with the letter as well as the spirit of Islamic teaching' (Wilson, 1985, p. 42); and
4. 'prepare a religious auditing report which is regarded as part of the annual report, [in which it] verifies whether the bank's operations are in conformity with the *Shari'a* (El-Ashker, 1987, p. 119).

However, despite these internal self-regulations, Islamic banks and other interested parties have recently appreciated the need to externally self-regulate their financial reporting. In effect, this would replace the second duty performed by the SSB, namely to participate in setting accounting policies for the bank. Karim (1990b) argues that rather than leave the matter to their regulatory bodies, Islamic banks have been urged to take the initiative in regulating their financial reporting, fearing that regulatory bodies may otherwise mandate the accounting policies of Islamic banks in order to achieve a uniformity between them and so improve the quality of their financial reporting.

In 1991, several parties (including practising accountants and *Shari'a* scholars) helped set up the FAOIBFI—a private-sector standard-setting body—in Bahrain with the aim of producing international accounting standards based on *Shari'a* precepts for Islamic banks and financial institutions.⁷ However, it is unusual in the Middle East for the private sector (of a certain industry) to unilaterally take the initiative of establishing a standard-setting body to regulate its financial reporting. Hence, the FAOIBFI is an exception.

The Financial Accounting Standards Board (the

Board), responsible within the FAOIBFI for setting accounting standards, consists of 22 unpaid part-time members representing Islamic banks, users of financial statements of these banks, practising accountants, academics, *Shari'a* scholars and regulatory bodies. The appointment of members of the Board and the raising of funds for the FAOIBFI are the two main duties of the Supervisory Committee, the highest authority in the FAOIBFI. The Supervisory Committee consists of 17 unpaid part-time members representing the same categories as the Board and appointed by representatives of Islamic banks. Members of the Supervisory Committee and the Board serve for a term of three and four years respectively and can be re-appointed for one term only. It is worth noting that the main reason behind having a two-tier structure is to separate the unit responsible for fund-raising from the unit in charge of producing the standards in order to minimise the influence of the former on the latter.

Given that Islamic banks were the main driving force behind the establishment of the FAOIBFI and that they currently finance its budget—which may mean that the survival of the FAOIBFI may depend on how well the standards it produces are accepted by Islamic banks—it is arguable that these banks could 'capture' the regulatory process of the FAOIBFI to promote their own self-interest. However, this seems to be unlikely for the following reasons:

- (a) Islamic banks do not dominate the Board because they occupy only six of its seats.
- (b) The discussions of the exposure drafts of the objectives and concepts of financial accounting have revealed that Islamic banks do not have a unified viewpoint on major issues (e.g. the treatment of investment accounts as an on or off balance sheet item, as discussed later).
- (c) The parties affected by the FAOIBFI's standards (e.g. Islamic banks, auditors and users of financial statements) have a divergence of interests.
- (d) The views of the *Shari'a* scholars in the Board are usually given significant considerations in accounting policy deliberations. These views may or may not match with those of Islamic banks.

The FAOIBFI has an extensive due process of seven phases which governs the production of its accounting standards (FAOIBFI, 1992c). This due process includes the vetting of the doctrinal suitability of proposed standards by a *Shari'a* Committee and also provides interested parties with the opportunity to express their opinion on the standards before they are finally approved by the Board. Although the due process of the FAOIBFI is similar in many respects to that used by Western

⁷See Karim (1990b) for a detailed account of the events that led to the establishment of the FAOIBFI and the parties that were involved in that process.

and international standard-setting bodies, it does not require the issuance of a discussion memorandum to set forth the issues to be addressed by the standards and the alternative views without conclusion. Furthermore, the FAOIBFI's due process does not require the holding of a public hearing to discuss an exposure draft. The steering committee which drafted the due process felt that those requirements would be impractical to implement in a multi-national set-up.

At present the FAOIBFI has neither the consent of regulatory bodies (e.g. central banks) nor the power to force Islamic banks to implement its proposed standards. Hence, in order to ensure compliance with its standards, the FAOIBFI may have no choice but to obtain the support of the concerned regulatory bodies and/or to try to secure the co-operation of at least the major Islamic banks and their auditors. As suggested by Peasnell (1982) with regard to the situation in Britain during the time of the Accounting Standards Committee (ASC), this could mean that the FAOIBFI's accounting standards would be produced by what is, in essence, a bargaining process. However, even if that were to be the case, the accounting practices emanating from such a process would still have to be within the boundaries of what is permissible by *Shari'a* precepts.

On the other hand, given that Islamic banks are set up in many parts of the world and are therefore subject to different requirements of regulatory bodies and various legislation, adherence to the FAOIBFI's standards might not be an easy task to achieve. For example, Ahmad and Hamat (1992, p. 53) report that in Malaysia the law stipulates that the first priority for Islamic banks is the *Shari'a*, followed by the legal requirements and, finally, accounting standards requirements. In addition, some Islamic banks (e.g. the Jordan Islamic Bank) were established by special laws which include accounting policies that have to be implemented by the banks. Changes in these laws would require the approval of the legislative bodies in these countries.

Following a similar approach to that of the FASB in the US, the FAOIBFI has decided to start its work by developing objectives and concepts of financial accounting for Islamic banks. In September 1992 the FAOIBFI issued two Exposure Drafts, one on the objectives of financial accounting and the other on the concepts of financial accounting (FAOIBFI, 1992a; 1992b). These were revised in April 1993 (FAOIBFI, 1993a; 1993b). The final statements were approved by the Board in October 1993 as *Financial Accounting Statement No. 1: Objectives of Financial Accounting for Is-*

lamic Banks and Financial Institutions (FAOIBFI, 1993c) and *Financial Accounting Statement No. 2: Concepts of Financial Accounting for Islamic Banks and Financial Institutions* (FAOIBFI, 1993d). At present the FAOIBFI has no plans to issue additional statements on what may be called its theoretical framework.

The next section discusses the methodology pursued by the FAOIBFI in developing its objectives and concepts of financial accounting.

FAOIBFI's methodology of developing objectives and concepts of financial accounting⁸

In regulating the financial reporting by Islamic banks, the FAOIBFI claims:

'Financial accounting plays an important role in providing the information which users of the financial statements of Islamic banks depend on in assessing the bank's compliance with the precepts of *Shari'a*. However, to perform this role effectively, accounting standards need to be developed and complied with by Islamic banks. The development of such standards *must* be based on clear objectives of financial accounting and agreed upon definitions of its concepts' (FAOIBFI, 1993c, para. 11, emphasis added).

Two options were considered by the FAOIBFI in developing objectives of financial accounting:

1. 'Establish objectives based on the principles of Islam and its teachings and then consider these established objectives in relation to contemporary accounting thought'; or
2. 'start with objectives established in contemporary accounting thought, test them against Islamic *Shari'a*, accept those that are consistent with *Shari'a* and reject those that are not' (FAOIBFI, 1993c, para. 23).

According to the first approach, the development of objectives should start by deducing from the *Shari'a* precepts what ought to be the objectives of financial accounting. These would then be supplemented, if necessary, by (Western) objectives of financial accounting that do not breach *Shari'a* precepts and are deemed to be appropriate for Islamic banks.

Advocates of this approach believe that this would help to minimise the influence of secular contemporary accounting thought on the objectives to be developed. In addition, it would encourage the consultants who were in charge of this task to look beyond purely secular methodologies.

The second approach calls for adopting the objectives of (Western) financial accounting currently available in contemporary accounting thought that are appropriate for Islamic banks

⁸The author participated in all the sessions in which the objectives and concepts of financial accounting were discussed.

provided that any objective violating the *Shari'a* precepts is excluded. This approach would also include those objectives implicit in the financial reporting by Islamic banks (e.g. the disclosure of information reflecting the bank's activities in fulfilling its social responsibilities) as well as those objectives that the FAOIBFI considers obligatory to the financial accounting of Islamic banks (e.g. the provision of information demonstrating that the bank's transactions have been conducted in accordance with the *Shari'a* precepts). The latter would focus on the moral dimensions that are absent in contemporary accounting thought since it was developed on the basis of separation between spiritual and temporal affairs.

After a lengthy process of discussions, which involved accounting academics and practitioners, *Shari'a* scholars, Islamic bankers and officials in central banks, it was agreed that the second approach should be adopted for the development of objectives. According to *Shari'a* scholars the methodology of this approach is acceptable from a *Shari'a* perspective.⁹ Although no justifications were provided for the selection of the second approach, both approaches are in compliance with *Shari'a* precepts. Therefore, there was no reason to refrain from considering what was available in contemporary accounting thought.

A similar approach was also pursued in developing the concepts of financial accounting which comprised the following:

- '(a) The identification of accounting concepts which have been previously developed by other institutions that are consistent with the Islamic ideals of accuracy and fairness. It is unlikely that anyone would dispute the adoption of such concepts, for example those relating to defining the characteristics of useful accounting information such as relevance and reliability.
- '(b) The identification of concepts which are used in traditional financial accounting but are inconsistent with Islamic *Shari'a*. Such concepts were either rejected or sufficiently modified to comply with the

Shari'a in order to make them useful. An example of such concepts is the time value of money as a measurement attribute.¹⁰

- '(c) The development of those concepts defining certain aspects of financial accounting for Islamic banks that are unique to the Islamic way of transacting business. The development of these concepts was particularly emphasised in this Statement. Examples include concepts developed based on the Islamic laws defining the risks and rewards associated with business transactions, and the incurrence of costs and earnings of profits' (FAOIBFI, 1993d, para. 7).

The approach adopted by the FAOIBFI for the development of objectives and concepts of financial accounting is shared by those who believe that

'most of the accounting issues found in the operation of Islamic banks fall within the scope of existing accounting standards ... [and, therefore,] there is no requirement for new standards to be formulated specifically for Islamic banks' (Ahmad and Hamat, 1992, p. 59).

However, others would have reservations since

'the conceptual framework of accounting currently applied in the West finds its justification in a dichotomy between business morality and private morality. As such, it cannot be implemented in other societies which have revealed doctrines and morals that govern all social, economic and political aspects of life.

Islam has its own cohesive rules which dictate how a business should be run. These rules can be applied at any time and in any culture. Accounting theory and practice have to pursue these rules if they are to be of any relevance to obedient Muslim users' (Gambling and Karim, 1991, pp. 103-4).

The latter view is further justified on the ground that:

'Neither Western accounting theory nor Western accounting standards explicitly deal with the morality of the objectives of commercial accounting entities, or even of the methods by which they are pursued' (Gambling et al., 1993, p. 196).

Indeed, the objectives of financial reporting stated in the CFs developed by Western standard-setting bodies tend to focus mainly on providing

⁹In addition to the approval of the *Shari'a* consultants who have worked on these projects for the FAOIBFI, support of other *Shari'a* scholars to this methodology was expressed in the seminar on Objectives, Concepts and Standards of Financial Accounting for Islamic Banks and Financial Institutions which was held by the FAOIBFI on 12-13 December 1992 to discuss the objectives and concepts of financial accounting for Islamic banks.

¹⁰This suggests that the FAOIBFI does not accept the concept of time value of money except in relation to real transactions as in the case of *Murabaha* transactions (sale of goods at cost plus margin of profit) where it is considered legitimate to sell an object (other than money) at a higher deferred price compared to its spot price.

information useful in making economic decisions. This narrow perspective of accounting gives no credence to such non-market considerations as social responsibility or 'illegal acts'.^{11,12} Nonetheless, despite its absence in Western CFs and 'measurement and integration problems, the development of [socially related] narrative and non-traditional reporting in the annual report has increased to such an extent that it cannot be ignored by modern accountants' (Mathews and Perera, 1991, p. 334).

Furthermore, it is arguable that in borrowing accounting CFs that are developed for specific countries consideration should be given to 'a society's institutional arrangements with regard to the legal and political systems, corporate ownership, capital market, professional associations, education, religion and so on, which impact upon accounting values and accounting practices' (Mathews and Perera, 1991, p. 326). For example, Macve (1989, pp. 26–27) claims that

'the framework set out in the Solomons report, *Guidelines for Financial Reporting Standards*, is essentially a reiteration of the approach taken by FASB in its conceptual framework project ... legally-based aspects are dismissed as 'constraints', but legal roles of accounting are as, if not more, important than other roles. This is the major distinction between the US and the UK, which must be addressed in developing implementable UK guidelines, and makes importing FASB's framework "as it is" inappropriate. Solomons fails to address the British environment, nor does he explicitly consider how far our guidelines should harmonise with European thinking.'

¹¹Under UK company law, companies have to disclose charitable donations and illegal acts such as loans to directors.

¹²Gambling and Karim (1986) argue that a possible vehicle for developing a rigorous social accounting for both East and West may exist in some extension of the concepts behind the Islamic system of *Zakah* (see footnote 14 for the definition of *Zakah*).

¹³See Karim and Ali (1988) and Shirazi (1990) for more details on this and other instruments.

¹⁴*Zakah* is alms giving and it is a duty on all Muslims to pay it. It is distributed to a group of eight specific classes of the more or less relatively poor. Its amount differs according to the type of business. For example, in trade (which includes Islamic banks) it is levied at the rate of 2.5% while in industry the rate is 10%.

¹⁵This is a non-interest bearing loan which is provided by the bank to help those who are in need to achieve a social activity (e.g. to enable students to complete their education and craftsmen to enhance their profession). The loan is provided for a period of time with the understanding that it would be repaid at the end of the period. However, should the borrower prove to be unable to repay the loan, the bank may write-off the loan and treat it as a charitable contribution.

Unlike the approach adopted by the FAOIBFI, at present most Islamic banks set their own accounting policies with the help of their SSB but without reference to explicit objectives and concepts of financial accounting. In the case of Islamic banks, the SSB would tend to deal with the setting of accounting policies in two ways which are not mutually exclusive. These are, firstly, to prescribe accounting policies based on an interpretation of *Shari'a* precepts; and, secondly, to ensure that the accounting policies adopted by the bank from contemporary accounting practices do not breach *Shari'a* precepts.

An example of the first approach to setting accounting policies is the recommendation by the SSB in some Islamic banks (e.g. Tadamon Islamic Bank and Faisal Islamic Bank-Sudan) to recognise revenue generated through the financing instrument of *Murabaha*¹³ only when the full amount is collected, thereby favouring a cash basis treatment. However, other Islamic banks (e.g. Faysal Islamic Bank of Bahrain, Jordan Islamic Bank and Bank Islam Malaysia Berhad) implement different accounting policies for the treatment of the same transaction. On these issues *Shari'a* precepts are broad enough to accommodate more than a single interpretation.

Furthermore, Islamic banks pursue objectives of financial accounting that their SSB consider ought to be fulfilled from a *Shari'a* perspective. For example, as evidence of fulfilling their social obligations, the Faisal Islamic Bank-Egypt and Bahrain Islamic Bank disclose the payment of *Zakah*¹⁴ and *al-Qard al-Hassan*¹⁵ in separate statements in their annual report. This is similar to the social responsibility objective proposed by the FAOIBFI in its statement of objectives.

The position the FAOIBFI may take with regard to the accounting policies developed by each Islamic banks has parallels with the ASC's experience in Britain. According to Solomons (1989, pp. 1–2), the ASC

'did not start with a clean sheet. It inherited a considerable body of prescriptions that had evolved over the years. In SSAP 2 [Statement of Standard Accounting Practice], issued in November 1971, it recognised four fundamental concepts as having general acceptability ... These concepts were part of the accountant's mental stock-in-trade long before the ASC came into existence or the Council's [of the Institute of Chartered Accountants in England and Wales] earlier recommendations were promulgated'.

The accounting policies already set by Islamic banks with the help of their SSB may or may not fit in with the objectives and concepts developed by the FAOIBFI.

There are at least three reasons why it would be difficult for the FAOIBFI to ignore such accounting policies or consider not adopting some of them when developing its accounting standards.¹⁶ These reasons are:

1. The accounting policies developed with the help of the SSB are based on the latter's interpretation of *Shari'a* precepts which is the same framework that governs the FAOIBFI in the setting of its accounting standards. As stated earlier, this does not mean that there would not be differences in the interpretation of *Shari'a* precepts when favouring a certain accounting treatment. However, it would require the FAOIBFI to produce very convincing arguments to justify the accounting treatment it would be proposing if it were to persuade Islamic banks to adopt it and abandon their existing accounting policy.
2. The accounting policies of such Islamic banks as Jordan Islamic Bank (which are based on certain *Shari'a* precepts) are incorporated in the articles and memorandum of association of the bank. These would form the starting point for the survey to be conducted by the FAOIBFI when preparing accounting standards as stated in its due process (FAOIBFI, 1992b). However, such accounting policies could hinder the implementation of the standards promulgated by the FAOIBFI if these standards recommend a different treatment than the one currently implemented by the bank.
3. In order to gain the recognition and support of Islamic banks in the implementation of its standards, and given that it currently lacks the power to enforce the standards it will produce, the FAOIBFI might find it necessary to demonstrate to Islamic banks that it has not completely discarded the efforts that they have exerted in setting up their own accounting policies with the help of their SSB. Yet, the differences in the accounting practices of Islamic banks mean that it is likely that the resulting standards would be derived from mutual bargaining.

¹⁶However, this does not necessarily mean that the FAOIBFI would confine its choice only to the existing practices of Islamic banks.

¹⁷The first Statements of Financial Accounting Concepts are: No. 1, *Objectives of Financial Reporting by Business Enterprises* (FASB, 1978); No. 2, *Qualitative Characteristics of Accounting Information* (FASB, 1980a); No. 3, *Elements of Financial Statements of Business Enterprises* (FASB, 1980b); No. 5, *Recognition and Measurement in Financial Statements of Business Enterprises* (FASB, 1984); No. 6, *Elements of Financial Statements* (FASB, 1985). (Statement No. 6 supersedes Statement No. 3 as well as paragraph 4 and footnote 2 of Statement No. 2).

The theme emerging from the preceding analysis advances the view that whereas both the FAOIBFI and Islamic banks are mandated by the *Shari'a* principles in the setting of their accounting policies, they differ in the approach by which such a process is carried out. However, (a) given that the policies governing financial accounting of Islamic banks in both regulated and unregulated markets are necessarily *deduced* from and/or *justified* with reference to *Shari'a* precepts, regardless of the existence of explicit objectives and concepts of financial accounting; and (b) since the FAOIBFI is unlikely to ignore the existing accounting policies of Islamic banks which may or may not fit in with its objectives and concepts of financial accounting, then why is a theoretical framework needed?

The FAOIBFI's need for a conceptual framework

The need for a theoretical foundation to address emerging accounting issues and to provide justification for the standards to be selected has long been appreciated by standard-setting bodies in the West. In the US, the FASB has developed a CF which consists of a set of general principles, claims and concepts regarding financial accounting and reporting. These are spelled out in five Statements of Financial Accounting Concepts relating to profit-oriented businesses.¹⁷ In the UK, the ASC started in 1989 to make use of the IASC's *Framework for the Preparation and Presentation of Financial Statements* and *Solomons' Guidelines for Financial Reporting Standards* (Nobes and Parker, 1991, p. 138), and in 1991 the ASB published as exposure draft *Statement of Principles* which seems to be the first part of a CF.

The development of the FASB's CF was apparently designed to overcome some of the shortcomings of the approach of its predecessor the Accounting Principles Board which

'proceeded to face each issue on an ad hoc basis, without a body of fundamental theory to guide it' (Zeff and Keller, 1985, p. 77),

and which was also

'criticised for not having made adequate progress toward developing a normative set of objectives and concepts for corporate financial reporting' (Pacter, 1985, p. 87).

The FASB defines its CF as

'a *constitution*' a coherent system of inter-related objectives and fundamentals that can lead to consistent standards and that pre-

scribes the nature, function and limits of financial accounting and financial statements...' (FASB, 1976, p. 2, emphasis in original).

According to this view a CF

'serves as a sort of constitution governing the standard-setter's action... [or] as a theory of some sort "guiding" rather than constraining the FASB in its decision-making' (Gaa, 1988, p. 146).

However, others (e.g. Macve, 1981; Peasnell, 1982) have expressed concern about the rationale of CF projects, despite those who claim that 'it is doubtful whether, without a conceptual framework that commands widespread respect and support, a private sector standard-setting body can long survive' (Solomons, 1983, p. 115). In the UK, the study by Macve (1981), which was commissioned by the ASC, argued that while it would be possible to agree on broad statements, there was little prospect of reaching agreement on more detailed objectives for accounts and how they should be pursued, due to the variety of users' needs, conflicts of interest and disagreement about what is 'good' accounting practice. Such a sceptical view is shared by Peasnell (1982, p. 250) who argues that

'a CF is largely irrelevant to the needs of the ASC as presently constituted. *In a system highly dependent on the cooperation and goodwill of reporting companies, the ASC needs to preserve its freedom to bargain and hence to obfuscate points in dispute. Viewed from the ASC's perspective, a CF might be more of a hindrance than a help. Flexibility is all important; but flexibility seems to be what a CF is intended to eliminate*' (emphasis in original).

As an alternative, Peasnell suggests:

'Rather than providing a framework or platform for the standards programme, the CF could be intended to do no more than provide very broad general objectives for financial reporting to which no one could take serious objection; the aim would be to "raise the moral tone" of the profession' (p. 255).

At the international level, the IASC's CF was published to assist in 'promoting harmonisation of regulations, accounting standards and procedures relating to the presentation of financial

statements' (IASC, 1989, para. 1). However, cultural differences which underlie social, economic, legal and religious differences between countries are likely to challenge the benefits to be obtained from such a CF. For example, Goeltz (1991, p. 86) observes:

'Too many different national groups have vested interests in maintaining their own standards and practices which have developed from widely different perspectives and histories. There is not a single, powerful champion of the proposal for harmonisation.'

Unlike Western and international accounting standard-setting bodies, the FAOIBFI must operate within a revealed ideological foundation to which it has to adhere in setting accounting standards if the latter were to be perceived as credible. However, in addition to the *Shari'a* framework the FAOIBFI has opted to develop a theoretical foundation for the financial accounting and reporting of Islamic banks which must not breach the revealed injunctions.

The *Shari'a* doctrines are general in nature and are meant to act as basic values and fundamental principles that provide guidance to Muslims in all aspects of their life at all times. Their nature is ahistorical. It is on the basis of these foundations that inferences have to be drawn or justifications provided for specific (accounting) applications.

Fiqh (Islamic jurisprudence) refers to human understanding of the *Shari'a* injunctions. It is subject to change with the changes in time and place. The nature of *Fiqh* is human and not Divine, although its rulings are derived from the *Shari'a*. However, despite the fact that the derivation of the rulings from the *Shari'a* is done according to *Usul al Fiqh* (Principles of Islamic Jurisprudence) there is still some scope for different acceptable interpretations. These differences have evolved into four principal schools of *fiqh*.¹⁸ It should be noted, however, that in certain matters, the *Shari'a* includes specific and definitive rulings about basic concepts and fundamental principles (e.g. the prohibition of gambling and hoarding) which are not subject to different interpretations.

The different interpretations of *Shari'a* injunctions by the four schools of *fiqh* would give rise to variations in the accounting treatment of issues affected by *Shari'a* rulings (e.g. revenue recognition, revaluation of investments, foreign exchange transactions, provision for doubtful debts).¹⁹ Given the moral nature of these differences, it is unlikely that the regulation of the accounting treatments of these issues can be achieved by reference to a *theoretical foundation* which draws from secular accounting knowledge even if the latter does not violate the *Shari'a* principles. This is similar to the accounting rules

¹⁸There are two main Muslim sects, the Sunni and the Shi'ite. The four schools of *fiqh* belong to the former sect. The Shi'ite sect has its own *fiqh* and is not considered by the FAOIBFI because all Islamic banks, other than those in Iran, follow the Sunni *fiqh*.

¹⁹For more details on the *Shari'a* implications of these issues see Ahmad and Hamat (1992).

that have legal force (as in Germany and the UK) and thus do not require the guidance and justification or 'the authority and legitimacy of an image of a coherent theoretical foundation' (Hines, 1989, p. 86).

One possible alternative available for the FAOIBFI is to rely on its *Shari'a* Committee to agree upon an interpretation of the underlying *Shari'a* injunction and the accounting treatment and measurement method that is compatible with it which may or may not fit in with the FAOIBFI's objectives and concepts of financial accounting. However, if the *Shari'a* Committee fails to favour a particular treatment over the others, the FAOIBFI would have no option but to allow a number of acceptable accounting treatments for the same transaction based on different interpretations.²⁰ This should take place 'without any endorsement of controversial interpretations of the *Shari'a* ... [because] [i]deological standard-setting is neither practical nor desirable, from either the banking or the religious point of view' (Gambling et al., 1993, p. 201, emphasis in original). However, allowing a number of accounting treatments for the same transaction would undermine one of the main reasons behind the establishment of the FAOIBFI which is to achieve a high degree of comparability between the accounting policies of Islamic banks in order to improve the quality of their financial reporting.

The preceding analysis implies that the usefulness of the FAOIBFI's objectives and concepts in setting accounting standards would be mainly confined to those issues unaffected by *Shari'a* ruling. It also implies that the more the FAOIBFI considers setting accounting standards that are affected by doctrinal ruling, the less likely it is that it will use its own objectives and concepts.

On the other hand, the general nature of the *Shari'a* means that it does not cover all the issues and details for which an accounting policy would be required (e.g. related party disclosures). This suggests that such issues can be treated by borrowing from contemporary accounting practices *provided they do not involve a violation of Shari'a injunctions*. Perhaps it is for standards which need to be set for this type of issue that the objectives and concepts developed by the FAOIBFI could be appropriate. In addition, given the lack of accounting details in *Shari'a* injunctions, the FAOIBFI's objectives and concepts may be of help in the

disclosure and presentation of information pertaining to the issues that have *Shari'a* implications.

The relationship between *Shari'a* precepts and the FAOIBFI's theoretical foundation has parallels to the concept of the 'true and fair view' in accounting. Like the *Shari'a* doctrines which override accounting theoretical foundation for Islamic business organisations, the UK companies legislation and the EC Fourth Directive give the true and fair view concept overriding consideration relative to other criteria for choice of accounting method. The position of the 1989 UK Companies Act

'appears to be that, if compliance with the detailed requirements is not sufficient to give a true and fair view, the remedy is to give additional information. If compliance with the detailed requirements is inconsistent with giving a true and fair view, the directors must depart from the rules to the extent necessary to give a true and fair view' (Macve and Jackson, 1991, p. 59).

With regard to the EC Fourth Directive, Chopping and Skerratt (1994, p. 29) note that the true and fair view has two implications:

'If following the provisions of the directive would not lead the financial statements to give a true and fair view then additional disclosure should be given, and in certain cases true and fair may mean that departures will need to be made from the individual provisions of the directive. In the second case, member states have been given the right to draw up definitions of when a case is sufficiently exceptional that the need to give a true and fair view should override the requirement to comply with the detailed treatment (measurement) rules of the directive'.

However, whereas the SSB in Islamic banks and the FAOIBFI's *Shari'a* Committee have a duty to pass judgment (which is usually adhered to) as to whether an accounting treatment and measurement method is in consonance with *Shari'a* precepts, it is arguable whether the true and fair view requirement is a matter of law rather than a matter purely for accountants (McGee, 1991). For example, in the UK, opinion as to when departure could be allowed has varied between the Law Society and members of the accounting profession (Tweedie and Kellas, 1987). Nevertheless, it has been generally held that compliance with SSAPs, Financial Reporting Standards (FRSs) and abstracts of the Urgent Issues Task Force (UITF) is necessary to give a true and fair view and that financial statements not prepared in accordance with SSAPs, FRSs and abstracts of the UITF are

²⁰Such an option has also been used by Western standard-setting bodies. The set of standards produced by the IASC allowed alternative treatments in a considerable number of cases. More recently, following its E32 in 1989, the IASC has proposed to reduce substantially the number of alternative treatments allowed by the IASs, eliminating some and 'demoting' others to the status of 'less preferred methods'.

less likely to be regarded by the courts as true and fair (Arden, 1993).

Furthermore, it is observed that if and when the combination of statutory requirements and applicable/approved accounting standards covers all important aspects of financial reporting

'it could be argued that there will be no place for the concept of a true and fair view since the emphasis will then have tilted overwhelmingly towards compliance rather than legitimating the exercise of individual professional judgment ... [However], the British accountancy profession seems insistent on retaining an overall true and fair criterion for accounts, perhaps in part as a defence against creative accounting ... and the perceived incursions of lawyers into accounting "territory" (Tweedie, 1983)' (Nobes and Parker, 1991, pp. 140-41).

This is highly unlikely to be the case with regard to the compliance of financial reporting by Islamic banks with *Shari'a* injunctions.

The next section casts light on some of the issues that highlight the difficulties the FAOIBFI may encounter in using its objectives and concepts for standard setting.

Difficulties of implementing the FAOIBFI conceptual framework

Although the FAOIBFI does not label its objectives and concepts as a CF, the functional benefits mentioned in support of determining objectives of financial accounting for Islamic banks are almost identical to those cited by the FASB (1976) in favour of having a CF. This seems to be in line with the FAOIBFI's methodology of adopting from contemporary accounting thought those parts which do not breach *Shari'a* precepts.

For the FAOIBFI, the development of objectives of financial accounting is necessary because they would:

- (a) '... be used as a guide ... when developing financial accounting standards. This should assure consistency in developing standards';

- (b) '... assist Islamic banks, in the absence of accepted accounting standards, in making choices among alternative accounting treatments';
- (c) '... be available as a guide and a regulator of subjective judgment made by management when preparing the financial statements and other financial reports';
- (d) '... increase users' confidence and understanding of accounting information and, in turn, their confidence in Islamic banks'; and
- (e) '... lead to the development of accounting standards which are likely to be consistent with each other. This should increase users' confidence in the financial reports of Islamic banks' (FAOIBFI, 1993c, para. 19).

However, doubts have been expressed about previous attempts to develop CF projects with similar benefits. In the case of the FASB, several authors (e.g. Dopuch and Sunder, 1985; Agrawal, 1987; Kripke, 1989; Archer, 1993) have expressed concern as to whether such functional benefits can be realised. For example, examining the first two benefits stated by the FASB namely, guidance for establishing standards and resolution of accounting questions in the absence of standards, Dopuch and Sunder (1985, p. 105) argue that

'the results of the FASB's effort to write objectives and definitions are hardly different from previous attempts of this nature and, as such, are unlikely to help resolve major accounting issues or to set standards of financial reporting as the FASB had expected'.

Dopuch and Sunder are also sceptical of the validity of the last three benefits. They assert that the empirical and analytical contents of these benefits are not clear.

Other commentators have raised the problem of the social-choice aspect of accounting standard-setting. According to Demski (1973), it is impossible to develop a single model of accounting that can be applied to accounting alternatives in a way that will satisfy everybody. Cushing (1977), however, does not share this view and suggests a partial, piecemeal approach as a way of addressing accounting standards. Bromwich (1980) argues that the conditions for the successful use of the partial approach are fairly restrictive but, when applicable, they substantially reduce the problems facing accounting standard-setting bodies.

The FAOIBFI's CF is no exception. One of the main sources through which Islamic banks mobilise funds is unrestricted investment accounts.²¹ At present, Islamic banks are divided on the accounting treatment of this source of funds. Based on their SSB interpretation of the *Shari'a*,

²¹The relationship between holders of unrestricted investment accounts and the bank is based on the *Mudaraba* contract (see footnote 5). Holders of these accounts deposit their funds with the bank to be invested on their behalf. They are not guaranteed any predetermined rate of return or given first claim on the bank's earnings (e.g. in 1984, Kuwait Finance House, one of the largest commercial Islamic banks, did not distribute any profits to holders of these accounts or to its shareholders). Rather, they share with the bank in the profits pertaining to their investments and bear the full risks in case of loss. Unlike shareholders, investment account holders do not have control over the management of the bank.

some banks (e.g. Kuwait Finance House, Jordan Islamic Bank and Faisal Islamic Bank in Egypt and Sudan) treat investment accounts as an on-balance sheet item while others (e.g. Faysal Islamic Bank of Bahrain) treat them as an off-balance sheet item. In addition, the former group of banks treats the applications of funds deposited in investment accounts as assets and considers the source of funds of these accounts as a liability.

The FAOIBFI distinguishes between restricted and unrestricted investment accounts and treats them as off and on-balance sheet items, respectively. Furthermore, the FAOIBFI treats the application of funds deposited in unrestricted investment accounts and their equivalents as assets, but does not consider the source of these funds as

'a liability for the purpose of financial accounting. This is because the Islamic bank is not obligated in case of loss to return the original amount of funds received from the account holders unless the loss is due to negligence or breach of contract. Likewise, equity of unrestricted investment account holders and their equivalent is not part of the ownership equity in the Islamic bank since the holders of these accounts and their equivalent do not enjoy the same ownership rights...' (FAOIBFI, 1993d, para. 29).

Rather, the FAOIBFI considers unrestricted investment accounts as an additional element of the statement of financial position of Islamic banks (FAOIBFI, 1993d, para. 25).

The FAOIBFI's treatment of unrestricted investment accounts, which is approved by its *Shari'a* members of the Board, has major accounting implications as well as implications for the capital adequacy ratio regulation which is used by regulatory bodies to measure Islamic banks' credit risk. Hence, whether the concerned accounting professional bodies and regulatory authorities would accept use of the FAOIBFI's definition remains to be seen.

The difficulties arising from reporting certain kinds of financing as on or off-balance sheet items are also faced by the CFs of the FASB, IASC and ASB. These problems tend to centre around the definition of the scope and nature of the reporting entity (e.g. the determination of which assets and liabilities are to be regarded as attributable to the group of companies) and the definition of assets,

liabilities and equity (e.g. the distinction between a finance lease and an operating lease) (see Peasnell and Yaansah, 1988; Rutherford, 1988; Tweedie and Whittington, 1990).

Another controversial issue is the revaluation of assets and liabilities at their cash equivalent value which was initially proposed by the FAOIBFI in the first exposure draft of the statement of concepts (FAOIBFI, 1992b).²² It is claimed that the use of this accounting measurement would ensure

'equitable allocation of the results of unrestricted investments between the holders of unrestricted investment accounts who have provided or withdrawn funds at different points of time during the lives of those investments, on the one hand, and between such account holders as a group and owners of the Islamic bank on the other hand' (FAOIBFI, 1993d, para. 92) ... 'if unrestricted investments were to be measured at their acquisition (historical) cost, inequities would occur in the distribution of investment results between holders of investment accounts who provide or withdraw funds at different points of time during the lives of those investments. Likewise, inequities would occur in the distribution of unrestricted investment results between the holders of unrestricted investment accounts as a group and owners of the Islamic bank' (para. 93).

In the first exposure draft, the FAOIBFI was of the opinion that the use of the cash equivalent value expected to be realised or paid 'is an attribute which should be measured in financial accounting for Islamic banks' (FAOIBFI, 1992b, p. 19) and if the bank cannot reasonably measure the cash equivalent value, the FAOIBFI recommended the use of historical cost (p. 20). The fact that the FAOIBFI proposed the use of two measurements for the same purpose is an indication of the limited usefulness of its CF as a guide in resolving controversial issues and also a reflection of its inability to enforce its pronouncements.²³

The revaluation of assets at their cash equivalent value means that the estimated profits resulting from the revaluation should either be distributed to holders of investment accounts if the revaluation process results in unrealised holding gains, or be kept in a special capital reserve account. However, the latter would deprive holders of unrestricted investment accounts who terminate their contractual relationship with the bank, from the benefits for which the FAOIBFI has justified the use of the cash equivalent value.

Islamic banks are also divided on this issue. While some Islamic banks (e.g. Faysal Islamic Bank in Bahrain) do revalue assets and liabilities at their cash equivalent to determine the results of unrestricted investment account holders, other

²²According to Macve and Gwilliam (1993), in a Lloyd's syndicate, where there is a 'sale' of the business from one year's syndicate to the next, the majority of assets are valued at the amount receivable or current market value.

²³Similarly, the IASC stated in its *Framework for the Preparation and Presentation of Financial Statements* (1989) that in case of conflict between the framework and a standard, the requirements of the latter should prevail.

Islamic banks (e.g. Jordan Islamic Bank) cannot use the cash equivalent value because their articles and memorandum of association specify that assets cannot be valued other than on the basis of historical cost.

The position of the FAOIBFI on this issue in the first exposure draft, that assets and liabilities should be revalued at their cash equivalent value, has attracted strong resistance, particularly from some eminent *Shari'a* scholars²⁴ who firmly believe that the distribution of unrealised holding gains violate *Shari'a* principles. Other *Shari'a* scholars, however, are of the opinion that the FAOIBFI should use the cash equivalent value because it would lead to fair distribution of results between the concerned parties. The FAOIBFI has changed its position and the *Financial Accounting Statement No. 2: Concepts of Financial Accounting for Islamic Banks and Financial Institutions* (1993) no longer makes it mandatory on Islamic banks to revalue assets and liabilities at their cash equivalent value. Rather, it requires Islamic banks to adhere to historical cost accounting. According to the FAOIBFI (1993d):

'Notwithstanding the relevance of revaluing assets, liabilities and restricted investments whenever investments are financed by holders of investment accounts, this concept will not be adopted at the present time. It is not evident that adequate means are currently available to apply this concept in a manner that is likely to produce reliable information (para. 96).

It is permissible, however, to apply this concept for the purpose of presenting supplemental information which may be relevant to an existing or a prospective holder of an investment account ... (para. 97).

The FAOIBFI's position has parallels with Western accounting practices. As early as 1939 MacNeal showed how by using historical cost accounting and not taking into consideration the changes in value of a firm's assets:

'Contemporary financial statements, as now prepared, frequently allow the managers and directors of a company to enrich themselves at the expense of stockholders, and to do so in the most comfortable and legal manner' (1977, p. 176).

Recently, the FASB (1993) has issued Statement of Financial Accounting Standards No. 115 which requires the recording of securities held for trading or available-for-sale at their fair value and those held-to-maturity at their amortised cost. In the UK, Macve and Jackson (1991) discuss the legal

difficulties facing firms other than banks that wish to use market value accounting in the revaluation of securities. They note:

'Firms appear to face a dilemma: either they have to depart from the balance sheet provisions of Sch. 4 by marking to market, but can rely on the [Companies Act] s. 262(3) definition of realised profits as the justification for including the gains and losses in the profit and loss account. Or, they make use of the alternative accounting rules to justify the balance sheet treatment, and again make use of s. 262(3) to justify inclusion of the gains and losses in the profit and loss account, but now have to depart from the provisions in Sch. 4 requiring those gains and losses to pass through revaluation reserve' (p. 54).

In their interviews with organisations in and connected with the securities industry, which generally favoured the use of marking to market, Macve and Jackson were nevertheless not able to find any strong support for the development of an accounting standard requiring marking to market. If guidance is needed a SORP would probably be regarded as preferable, and in line with the approach now adopted in relation to banks for whom a SORP on accounting for securities was issued by the British Bankers' Association in 1990 (BBA, 1990).

A further problem with the FAOIBFI's CF, which has a *Shari'a* implication, is that of revenue recognition. According to the FAOIBFI (1993d, para. 83):

'The basic principle for revenue recognition is that revenues should be recognised when realised. Realisation of revenues takes place when the following conditions are met:

- (a) The bank should have earned the right to receive the revenues...
- (b) There should be an obligation on the part of another party to remit a fixed or a determinable amount to the bank.
- (c) The amount of revenue should be known and should be collectible with reasonable degree of certainty, if not already collected.'

According to this definition revenue can be recognised on an accrual basis. However, this would have an impact on the distributable profit between equity holders and investment account holders. The latter relationship is based on the *Mudaraba* contract, which

'involves the distribution of cash profits, either periodically or at the end of the *Mudaraba* period. If recognition of income were to be made on the accrual basis, the distribution will require the Islamic banks to ad-

²⁴These views were expressed in the seminar in which the proposed objectives and concepts statements were discussed.

vance cash from other sources before collection of debtors account is made. If these accounts turn bad, the banks will have to use their own funds to make good for the loss. As such it will violate the conditions of *al-Mudarabah* arrangement where the loss should be borne by owners of capital [i.e. holders of investment account]. ... in this case the profit which has already been distributed will have to be treated as a refund of capital ... Therefore, it is more appropriate for Islamic banks to adopt the cash rather than the accrual basis of accounting' (Ahmad and Hamat, 1992, p. 60, emphasis in original).

One of the implications of the above argument is that the recognition of income from a bank's investments which are financed from the pooled funds of investment account holders and equity holders should be recognised on the cash basis whereas this would not necessarily apply if the same investments were financed exclusively by equity holders.

Western CFs also suffer from similar problems. Noke and Weetman (1992) examined some of the more complex and controversial areas of recognition practices which they claim would pose potential problems for any conceptual framework of principles. Their analysis demonstrates that a CF 'such as that of the IASC is adequate as an outline of principle, but is not sufficiently precise on each point of principle to be of use when controversial issues are addressed' (p. 31).

Despite its flaws, the FAOIBFI's CF may still be necessary to provide a basis that would achieve a high degree of standardisation in the accounting treatments of transactions that are not affected by *Shari'a* injunctions. It would also enhance the value of the financial statements of the banks by increasing their comparability. Furthermore, given that Islamic banks are relatively new organisations, a CF can help to unravel the theoretical underpinnings of their accounting practices, particularly since there is a severe dearth of literature on the financial accounting of these financial institutions.

On the other hand, both the FAOIBFI and Islamic banks would have a vested interest to see to it that the regulatory bodies in the countries in which Islamic banks operate agree to allow the latter to implement accounting standards that do not violate their revealed ideological doctrines and at the same time are relevant to their operations. One possible strategy by which the FAOIBFI and Islamic banks can convince the concerned regulatory bodies is to argue that the development of a CF helps to ensure that the accounting standards produced by the FAOIBFI are not set on an ad hoc basis. Indeed, they can buttress their position by highlighting the fact that an approach similar to

that of other recognised standard-setting bodies (such as the FASB, ASB and the IASC, whose accounting standards may have been adopted by the countries in which Islamic banks operate) has been pursued in setting accounting standards.

Such a strategy is not new to standard-setting bodies. Based on an historical analysis over a number of countries and centuries, Hines (1989) suggests that despite the apparent technical failure of CF projects, self-regulatory bodies still continue to show interest in their availability in order

'to assist in socially constructing the *appearance* of a coherent differentiated knowledge base for accounting standards, thus legitimising standards and the power, authority and self-regulation of the accounting profession ... and at times of threat to their legitimacy, and/or during times of possible intervention by government, or at times of competition from other (including accounting) groups' (pp. 85-86, emphases in original).

A similar argument is also voiced by Dopuch and Sunder (1985) and Watts and Zimmerman (1979; 1986). According to Dopuch and Sunder:

'Being largely an offspring of the accounting profession, the FASB has (as did the APB) little defence against the criticism that it does not have legitimate authority to make decisions which affect wealth transfers among members of society. Thus, a body like the FASB needs a conceptual framework simply to boost its public standing' (p. 115).

Concluding remarks

Islamic banks must abide by the *Shari'a* precepts in their business and financial transactions. SSBs form one of the internal control processes by which Islamic banks assure users of their financial reporting that the transactions conducted by the bank do not breach the *Shari'a* injunctions. However, Islamic banks have recently set up the FAOIBFI to externally regulate their financial reporting. The latter has published objectives and concepts of financial accounting that would act as a theoretical framework for the setting of accounting standards for Islamic banks.

This paper has discussed the FAOIBFI's approach for developing objectives and concepts of financial accounting and investigated the need for such a theoretical framework in the light of the current practices of Islamic banks in developing their own accounting policies with the help of their SSBs. It has been argued that the FAOIBFI may require objectives and concepts both for legitimating its own role and in mandating accounting standards for those issues which are not affected by *Shari'a* rulings, but this will be subject to the

limitations faced by all standard-setting bodies in utilising their conceptual frameworks. Moreover, the more the FAOIBFI sets accounting standards that incorporate doctrinal (*Shari'a*) ruling, the less it would tend to find its own theoretical framework useful.

The ambiguities that may arise from different interpretations of the religious rules will require resolutions primarily by reference to religious rather than accounting authority. This raises the interesting question of what the international objective of the FAOIBFI is—is it to promote a 'Western' image of Islamic banks (hence creating difficulties with religious image at home) or to defend the Islamic uniqueness of the banks in the face of a secular 'Western' world (hence causing difficulties in fitting with international standards)? However, although these questions are worthy of further investigation, they are beyond the scope of this paper.

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The Information Contained in Reconciliations to Earnings Based on US Accounting Principles By Non-US Companies

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Abstract—To improve comparability of financial statements across countries, the US Securities and Exchange Commission (SEC) requires non-US registrants to either issue financial statements based on US Generally Accepted Accounting Principles (GAAP) or provide in their footnotes a reconciliation of their foreign accounts to their US GAAP counterparts. The New York Stock Exchange has requested the elimination of this requirement on the basis that it serves as a barrier to non-US companies that desire to enter the US market. The SEC maintains that the reconciliations provide important information to investors when assessing the value of a company's stock. This study investigates the information content claim made by the SEC. An event study methodology is utilised that measures the stock price reaction within a short window surrounding the SEC filing date of the firm's 20-F (analogous to the 10-K for US firms). A significantly positive correlation is documented between the stock price reaction and the change in the aggregate reconciliation. This result implies that US GAAP disclosures provide information to the market when the 20-F arrives at the SEC.

Introduction

All foreign registrants of the US Securities and Exchange Commission (SEC) may provide financial statements based on non-US accounting principles only if reconciling data are included. The New York Stock Exchange (NYSE) has requested the elimination of the US GAAP reconciliation requirement on the basis that it impedes the globalisation of capital markets and puts US security exchanges at a competitive disadvantage in their effort to attract more foreign listings (Salwen, 1991).¹ William

Donaldson, chairman of the NYSE, has asserted that the NYSE faces the threat of becoming a regional exchange in a global market (Siconolfi and Salwen, 1992). Ultimately, this issue is of concern to investors since some favourable investment opportunities will not be accessible on US exchanges. If the US investor chooses to cross national borders to access a desired investment, greater expenses will be incurred (Salwen, 1991; Jarrell, 1992) and less information may be provided since other regulatory bodies do not require as much disclosure as the SEC (GAO, 1989).

The SEC's primary objectives are to protect investors and maintain market integrity. Its position is that the reconciliation does provide incremental information that affects firm value (Schapiro, 1993) and that investors and issuers benefit from a policy requiring all corporations utilising US markets to abide by the same strict rules. Investors can compare and assess the financial health of different corporations more readily and, therefore, they will demand a lower rate of return due to reduced risk. Choi and Levich (1991) conducted a survey of institutional investors, corporate issuers, investment underwriters and market regulators in Germany, Japan, Switzerland, the UK and the US that lends support to the view that comparability of financial statements is an important issue to investors. About one-half of the participants indicated that international accounting diversity affects their capital market decisions.

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¹This claim is supported by some empirical evidence. Biddle and Saudagaran (1989) documented that management's choice among alternative foreign stock exchanges is correlated with the disclosure requirements of the exchange. They conclude that firms are more likely to list their securities on exchanges with less stringent trading rules. Anecdotal evidence was also provided by comment letters sent to the SEC at the time the Integrated Disclosure System was proposed. Those letters routinely suggested that the stringent SEC disclosure requirements discouraged many firms from listing on American exchanges and resulted in some current registrants of the SEC to seriously consider withdrawing from the US market entirely.

On the other hand, some critics of the reconciliation requirement have asserted that the additional US GAAP disclosures serve no useful purpose. The SEC rule has been described as 'anachronistic' and 'obstructive' (Freund, 1993). The NYSE claims that securities from only first class companies, which have little incentive to deceive investors, would be listed; therefore, financial statements based on non-US GAAP would be adequate and US GAAP earnings would not provide significant incremental information. Baumol and Malkiel (1993) present evidence that investors can efficiently price securities listed on European and Pacific Rim stock exchanges without the use of US GAAP data. The authors conclude that share prices for non-US companies are as efficient as those for US companies and that 'there is good reason to doubt that investors would benefit at all from any additional disclosure'.

This study evaluates the information content issue of the US GAAP reconciliation by examining stock price reactions surrounding the filing of the 20-F with the SEC. The event study results documented in this study are consistent with the SEC's position that the requirement to provide US GAAP reconciliations should be retained.

Institutional setting

Prior to 1982, non-US firms that issued securities in US markets were required to file Form 20-K with the SEC, which was considered to be the equivalent of Form 10-K for US companies. Throughout the 1970s, however, there was a growing disparity between the disclosure requirements of the 10-K and those of the 20-K. In 1977, the SEC proposed a comprehensive revision to the rules and forms applicable to foreign registrants that would make the 20-K more comparable to Form 10-K. One of the major disclosure requirements on the amended form was that foreign firms either issue financial statements in accordance with US GAAP or provide a reconciliation of any material differences between non-US GAAP and US GAAP.²

When the revisions to the 20-K were proposed, the SEC received over 60 letters of comment. Over 80% of these letters specifically mentioned that the additional requirements as proposed would affect

the internationalisation of security markets and/or the US's ability to attract foreign companies. One letter even suggested this may have been an attempt by the SEC to discourage foreign firms from listing on US exchanges. The SEC was strongly criticised for changing the rules for issuers that had previously registered. Many companies stated that if they had known at the time they registered securities with the SEC that such rigid standards would eventually be required, they would never have entered the US market. The heavy criticism resulted in the SEC granting substantial concessions to foreign registrants³ but the requirement to disclose US GAAP data was upheld.

On 19 November 1982, the adoption of Form 20-F was officially completed when the SEC issued Financial Reporting Release (FRR) No. 7, *Adoption of Foreign Issuer Integrated Disclosure System*.⁴ The 20-F was required to be filled with the SEC for fiscal years ending on or after 15 December 1982. Since that time, the SEC has adopted a number of policies that attempt to lighten the burden placed on foreign firms converting to US GAAP.

On 23 April 1990, the SEC adopted Rule 144A, which allows companies to issue securities privately – and thereby avoiding registration with the SEC – without the normal restriction that the securities cannot be resold for the next two years. It was anticipated that non-US companies desiring to enter US markets would take full advantage of this opportunity. In August 1990, Staff Accounting Bulletin (SAB) No. 88 was issued, which released non-US firms from accounting for certain items if the home country did not require accounting for that particular item (e.g., post-retirement benefits other than pensions, supplemental oil and gas disclosures, and balance-sheet risk information). Finally, in 1991, the SEC entered into an initiative with the Ontario Securities Commission (OSC) called the 'Multi-jurisdictional Disclosure System' (MJDS), which is an effort by both the SEC and the OSC to improve access to each other's markets. Included in the initiative was the SEC's concession that Canadian firms did not need to provide the US GAAP reconciliation for non-convertible

²In 1967, the SEC did require that foreign firms' financial statements be audited and that material differences from US GAAP be quantified. However, the interpretation of this requirement varied substantially across companies, which led to the explicit requirement of a reconciliation to accompany Form 20-F (Greene and Ram, 1982). For a review of the major items contained in the reconciliation see Amir, Harris and Venuti (1993); Barth and Clinch (1993); US SEC (1993); and Bandyopadhyay, Hanna and Richardson (1994).

³The most significant concession was that only revenues attributable to industry and geographic segments were required to be disclosed. A narrative discussion about the contribution to profits by each segment was required only if it was materially different from the revenue contribution.

⁴Besides increasing disclosure requirements on Form 20-F, FRR 7 substantially reduced the filing costs for foreign firms. The disclosure requirements of the 1933 Securities Act and the 1934 Securities Exchange Act was made uniform; thus, eliminating some of the duplication in registration requirements. The periodic reporting under the 1934 Act is now deemed sufficient to satisfy disclosure requirements under the 1933 Act.

investment-grade debt and preferred stock issues. Further, the requirement for equity issues was to be phased out by 1 July 1993, if the SEC came to the conclusion that the reconciliations were not useful. The SEC has since decided the reconciliations are informative and thus, the requirement to provide reconciliations for equity issues has been retained.

Methodology and research design

Capital market research in accounting can be described as falling under two broad categories: (1) valuation studies – research examining the association between prices or long-window returns to available information – and (2) event studies – research that examines the market reaction (e.g., stock prices, trading volume, analysts' forecasts, etc.) to the release of new information.⁵ A number of recent studies have implemented the first type of methodology in analysing the value-relevance of the US GAAP reconciliation contained in the 20-F (e.g., Pope and Rees, 1993, Amir, Harris and Venuti, 1993; Bandyopadhyay, Hanna and Richardson, 1994; and Barth and Clinch, 1993).

In general, these studies have concluded that the US GAAP disclosures are value-relevant. However, the employment of valuation models cannot directly assess the issue of importance to the SEC and NYSE: whether the reconciliation disclosure requirement is incrementally *informative*. The finding that differences in non-US GAAP and US GAAP earnings are associated with returns and/or prices does not necessarily support the position of the SEC that a reconciliation should be provided. By the time the 20-F becomes available, the reconciliation to US GAAP could be 'stale' information.⁶

The event study methodology is able to investigate the informativeness issue more readily. A significant association between the reconciliation variable and a stock return surrounding a narrow event window implies that information is being provided to the market that is useful in assessing the value of a particular company's stock. An insignificant association, combined with evidence presented in the valuation studies, suggests that the

value-relevant information provided in the reconciliations is already known by the market prior to its disclosure.⁷

Although Amir et al. (1993) focus on their valuation model, they also investigate the stock price reaction surrounding the release of the reconciliation but do not find a significant reaction. McQueen (1993) also employs the event study methodology and finds results that contrast with those in Amir et al. in that a significant price reaction is documented. The evidence in this study is consistent with the results presented in McQueen and provides further support for the notion that the reconciliations are informative to the market. Possible reasons for the different results in this study and those documented in Amir et al. are noted and empirically examined in a later section. Given the importance of the subject to investors, security exchanges and regulatory bodies, the evidence in this study should be worthwhile.

Functional Form of the Model

Identifying the specific date that a particular item becomes public knowledge is critical when conducting event studies. Previous studies that have investigated the informativeness of disclosures contained in financial statements have utilised the date stamped on the SEC form, which is the date the form was received by the SEC (e.g., Wilson, 1987; Swaminathan, 1991; and Stice, 1991). Amir et al. (1993) provide evidence that the filing date of the 20-F with the SEC is the first time the reconciliation becomes public; therefore, this date is also used in this study.⁸ Prior to this date, investors will typically know non-US GAAP earnings due to a previous *Wall Street Journal* announcement, but have only expectations of the reconciliation to the US GAAP component of earnings. At the release of the reconciliation, the market must perceive it as being value-relevant and be sufficiently surprised by its magnitude and/or composition for a stock price reaction to occur. Therefore, a variable that proxies for the market's expectations must be formulated.

⁵See Brennan (1991) for a similar categorisation and a general overview of the methodologies implemented in these two research paradigms.

⁶Some results presented in Amir et al. (1993) and Barth and Clinch (1993) are consistent with investors being able to glean US GAAP information from alternative media (e.g., domestic financial statements). Both studies report that a significant association was documented between the US GAAP earnings reconciliation and an annual return measured three months after the fiscal year end even though for a large majority of the firms the 20-F was not filed with the SEC until close to the six-month deadline after the fiscal year end.

⁷Although an insignificant association between the reconciliation variable and a short-window stock return would be consistent with the notion that the actual disclosure of US GAAP data provides stale information, this finding does not preclude the possibility that the requirement is still useful since the company's previous year's US GAAP reconciliation combined with this year's earnings may be a significant factor in predicting this year's reconciliation.

⁸Results from other studies that use the SEC stamp date suggest that other value-relevant information is potentially being released with the US GAAP reconciliation. The conclusions presented in this study rely on the assumption that these other items are not highly correlated with the US GAAP reconciliation.

A naive, yet reasonable, expectations model might be expressed as follows:

$$E(\text{REC}_{it}) = \text{REC}_{it-1} \quad (1)$$

where REC_{it} is the reconciliation component of earnings per common share (or American Depository Receipt⁹ (ADR)) for firm i in time period t denominated in the firm's domestic currency. That is, this year's expected reconciliation component is last year's value. This expectations model can be justified by considering some examples. Unless a merger occurred during the year of analysis, the annual goodwill reconciling item would be expected to be substantially the same. Also, although the difference in pension expense under US and non-US GAAP will probably differ across time, investors would need to know the assumed schedule of payments to effectively forecast what this difference will be every year – information they are not likely to have. The same conclusions could be made for other differences in accounting across countries.

All amounts within the company's 20-F are reported in domestic currency. Since US returns are used in the regression, the financial statement variables are translated to American dollars using the exchange rate at the beginning of the event window. Therefore, if a company's earnings increased by £10 due to US GAAP adjustments in year $t-1$, the expected reconciliation amount for year t would also be £10. But if the exchange rate changed from \$1.50/£1 in year $t-1$ to \$1.60/£1 in year t , the expected amount as expressed in US dollars for year t would be \$16—not last year's \$15. Accordingly, the unexpected portion of the reconciliation component of earnings can be expressed as

$$\text{UR}_{it} = (\text{REC}_{it} - \text{REC}_{it-1})\rho_t \quad (2)$$

where UR is stated in US dollars and ρ denotes the relevant foreign currency exchange rate one day before the 20-F arrives at the SEC. The following OLS regression model will be used to assess the informativeness of the US GAAP reconciliation.¹⁰

$$R_{it} = \beta_0 + \beta_1 \text{UR}_{it} + \beta_2 \text{EXRT}_{it} + \epsilon_{it} \quad (3)$$

⁹An ADR is a negotiable certificate issued by a US depository bank that is traded and quoted on securities exchanges like any other security. The ADR has a legal claim on a prescribed number of shares that have been deposited with the bank by the foreign company.

¹⁰The OLS regression model pools observations over time and across firms, which results in inconsistent parameter estimates if relevant firm and/or time-specific variables are not accounted for in this model (Hsiao, 1986). To investigate this potential problem, two panel data models—a fixed effects and random effects model—that allow for differences over time and across firms were estimated and the results compared with the OLS results. Interpretations across the three different models are equivalent; therefore, only the OLS results are presented.

where,

R = an equally weighted market portfolio adjusted US return accumulated from one day before to three days after the 20-F is received by the SEC;

UR = the change in the US GAAP earnings reconciliation converted to US dollars using the exchange rate at the beginning of the event window and deflated by the market value of equity at the end of fiscal year t ;

EXRT = the percentage change in the strength of the foreign currency relative to the US dollar within the event window.

The dependent variable is market adjusted by subtracting a CRSP equally weighted market portfolio return from the firm-specific return to control for any market wide events. The five day event window is considered short enough to reduce the potential for confounding events yet wide enough to capture the effects of the reconciliation on prices. A significant β_1 coefficient provides evidence indicating the US GAAP reconciliation is informative to investors.

Since the regression equation implements US stock returns as the dependent variable, the variable EXRT is included in the model to explicitly control for exchange rate fluctuations, which potentially have a significant influence on US returns for non-US companies. For example, suppose a British firm has 10,000 shares issued in the US and 50,000 shares in the UK, which together represent a total value of £1,200,000 or £20 per share. If the exchange rate is \$1.50 = £1.00, each share will be sold in the US for \$30. If the exchange rate changes within the event window to \$1.45 = £1.00, the new equilibrium price will drop to \$29, due entirely to the weakening of the pound relative to the dollar.

This study includes exchange rate fluctuations in an effort to avoid an omitted variables bias that may affect interpretations of the reconciliation. Given the way EXRT is defined, a positive value indicates the dollar has weakened relative to the foreign currency; therefore, the expected sign of β_2 is positive.

Empirical results

Data Collection Procedures and Descriptive Statistics

The 1992 Compact Disc Disclosure Database was searched to identify firms that filed a 20-F with the SEC for fiscal year 1991. This procedure resulted in 352 firms being identified. Since *CD Disclosure* does not contain footnote data for all firms, the reconciliation data were gathered from *SEC File*, a microfiche database of SEC documents published by Q-data Corporation. The initial sample was

supplemented by additional firms identified during the data collection stage that filed 20-Fs prior to, but not for, the year 1991 and thus, were not included in the *CD Disclosure* search. The total number of identified firms filing a 20-F during the period 1982–1991 was 398.

To be retained in the final sample, a firm must meet the following screening criteria: (1) a reconciliation of US GAAP is provided (eliminated 143 firms);¹¹ (2) at least two consecutive years of data are available so that the proxy for the unexpected portion of the reconciliation can be computed according to equation (2) (eliminated 39 firms); (3) the firm has equity securities outstanding in the US (eliminated 17 firms); (4) price data from an organised exchange are available within the event window and at the fiscal year end (eliminated 30 firms); and (5) the firm's stock is frequently traded, i.e., the stock trades in the week prior to the event window, which establishes a market price before the release of the reconciliation, and the stock is traded within the event window (eliminated 19 firms). The above selection criteria resulted in a sample of 150 firms and 568 firm-year observations.

The Wall Street Journal was searched to determine if any confounding events occurred within the event window. Three firm-year observations were deleted because of other potentially confounding announcements being made within the event window (one announcement concerning a merger, one dividend reduction announcement, and one announcement concerning the hiring of a new chairman), which resulted in 565 firm-year observations.

Preliminary inspection of these data identified some extreme observations for the level and change in the US GAAP reconciliation. In the case of seven firm-year observations, the unexpected reconciliation component of earnings was in absolute value at least half the firm's market value of equity. The firms and their respective fiscal years that generated these extreme observations were Atlas Consolidated Mining & Development—1985; Giant Bay Resources Ltd—1990; Norsk Data Co—1989; Northgate Exploration Ltd—1988; Rea Gold Corp—1986; and Saatchi & Saatchi Co. plc—1990 and 1991.

The main reconciling items for Atlas Consolidated Mining & Development, domiciled in the

Philippines, were related to recording fixed assets at appraised values and not including unrealised foreign currency gains/losses in current period earnings. Giant Bay Resources and Rea Gold Corp were Canadian development stage companies in 1990 and 1986, respectively. Giant Bay Resources capitalised development costs instead of expensing them. Rea Gold Corp depreciated fixed assets based on appraised values as opposed to historical costs. These reconciling items caused a very large earnings reconciliation relative to the companies' market values. Northgate Exploration, a Canadian company, had an extreme UR value due to timing differences in accounting for gains.

Saatchi & Saatchi and Norsk Data had extreme UR values as a result of two effects. First, each company had changes in their aggregate reconciliation in these years ranging from over 200% to 700%. Saatchi & Saatchi's major reconciling item was mostly due to differences in measuring discontinued operations between US and UK GAAP, whereas Norsk Data's major reconciling item was deferred taxes. More importantly, however, was the change in their market values. Saatchi & Saatchi's price per ADR at fiscal year end 1990 was \$2 compared to \$12.75 just one year earlier. Similarly Norsk Data lost over 60% of its market value over a two-year period.

The studentised residuals and Cook's D statistics for these observations exceeded the suggested cut-off point by Belsey, Kuh and Welsch (1980), indicating that these observations exhibit undue influence on the parameter estimates. Therefore, the results tabulated in the paper are based on a final sample of 558 firm-year observations.¹²

Table 1 describes the sample selection process and the resulting distribution of the sample across countries and time. Most of the companies are domiciled in Canada and the UK. The number of firm-year observations increases over time, consistent with the expanded globalisation of capital markets.

Price information was initially obtained from the Center for Research Security Prices (CRSP) NYSE/ASE and NASDAQ tapes. Supplemental data were obtained from DRISEC, a database furnished by Data Resources Inc. However, accessing data from DRISEC resulted in a large number of firms that were not frequently traded, which had the potential of biasing the measured return in the return window. Therefore, selection criterion 5 was established to control for infrequently traded securities. The majority of the daily currency exchange rate information was obtained from DRIFACS,

¹¹This criterion eliminated 86 firms that abide by US GAAP or for which no significant differences exist between the domestic GAAP and US GAAP. All of the Israeli and Japanese firms, as well as a substantial number of Canadian firms, were included in this group. The 57 other firms, mostly Canadian, did not give a reason for failing to provide a reconciliation. Possible explanations would be: (a) exemption from this requirement (see US SEC (1984) for details related to exemptions granted to certain NASDAQ companies); and (b) non-compliance with the requirement (Frost and Pownall (1994) find that many UK companies exhibit substantial non-compliance with other SEC disclosure requirements).

¹²An alternative procedure for eliminating outliers commonly cited in the literature was also employed in this study where observations with UR in the 2% tails were deleted (see Foster, 1986; Dann, Masulis and Mayers, 1991). This method produced qualitatively identical results to those presented in the paper.

Table 1
Sample Selection Statistics and Distribution of Sample Across Countries and Time

Panel A: Sample selection screening results

Identified firms that filed a 20-F with the SEC during the period 1982-1991	398
Equity securities not issued	(17)
Reconciliation not provided in 20-F:	
Financial statements adhere to US GAAP	(86)
Other ¹	(57)
Two consecutive filings of 20-F data not available ²	(39)
Price data unavailable ³	(30)
Infrequently traded ⁴	(19)
Final sample of firms	<u>150</u>

Panel B: Distribution of firms and observations according to the accounting principles implemented in the financial statements

	<i>Firms</i>	<i>Firm-years</i>	<i>Percentage</i>
Australian GAAP	11	36	6.5
Canadian GAAP	56	150	26.9
Danish GAAP	1	8	1.4
Finnish GAAP	1	6	1.1
French GAAP	1	4	0.7
Hong Kong GAAP	2	4	0.7
International GAAP	3	15	2.7
Irish GAAP	2	3	0.5
Italian GAAP	2	6	1.1
Dutch GAAP	7	46	3.2
New Zealand GAAP	1	5	0.9
Norwegian GAAP	1	5	0.9
Philippines GAAP	2	13	2.3
South African GAAP	1	7	1.3
Spanish GAAP	3	16	2.9
Swedish GAAP	6	38	6.8
UK GAAP	50	196	35.1
Total	<u>150</u>	<u>558</u>	<u>100.0</u>

Panel C: Distribution of observations over time

<i>Year</i>	<i>Number</i>	<i>Percentage</i>	<i>Year</i>	<i>Number</i>	<i>Percentage</i>
1983	7	1.3	1988	90	16.1
1984	27	4.8	1989	93	16.7
1985	34	6.1	1990	95	17.0
1986	51	9.1	1991	81	14.5
1987	80	14.3			

¹Did not give a reason why a reconciliation was not provided.

²Two consecutive years of data were needed to calculate a proxy for the unexpected portion of the US GAAP reconciliation.

³Price data was gathered from the CRSP NYSE/ASE and NASDAQ tapes and supplemented by DRISEC.

⁴The stock must be traded in the week prior to the event window to establish a market price before the release of the US GAAP reconciliation and trading must occur within the event window to determine the effect of the reconciliation on market value.

another database furnished by Data Resources Inc. *The Wall Street Journal* was searched for those observations where DRIFACS did not provide the necessary data. The other data requirements were obtained from the 20-F, including the reconciliation amounts, fiscal year end and number of shares represented by one ADR.¹³

¹³Prices obtained from CRSP and DRISEC are listed as price per ADR. Therefore, the number of outstanding shares as reported by the company must be adjusted by the ADR ratio when computing market value of equity. In some instances, this item was not reported by the company. In these cases, the number of ADRs outstanding as reported by CRSP/DRISEC was compared with the number of shares outstanding as reported by the company and an ADR ratio was derived.

Table 2
Descriptive Statistics and Correlation Analysis¹

Panel A: Descriptive statistics²

Variable	Obs.	Mean	Std. dev.	Median	Minimum	Maximum
R	558	-0.0007	0.0620	-0.0022	-0.3815	0.4168
UR	558	-0.0024	0.0769	-0.0010	-0.4574	0.4233
REC	558	-0.0162**	0.0789	-0.0048**	-0.3680	0.3577
EXRT	558	0.0018**	0.0121	0.0014**	-0.0530	0.0481
MKTVAL	558	3166	5705	631.1	0.4167	47612

Panel B: Pearson Correlation Matrix

	R	UR	EXRT	MKTVAL
R	1.0000			
UR	0.1187**	1.0000		
EXRT	0.1686**	-0.0818	1.0000	
MKTVAL	0.0425	0.0029	0.0438	1.0000

¹R = an equally weighted market adjusted return from day -1 to day 3, where day 0 is the filing date of the 20-F with the SEC.

UR = the change in the total reconciliation adjusted for changes in foreign currency exchange rates, deflated by the market value of equity at the end of the fiscal year.

REC = the level of the reconciliation deflated by the market value of equity at the end of the fiscal year.

EXRT = the percentage change in the relevant currency exchange rate within the event window. MKTVAL = the market value of the firm's equity at the end of the fiscal year stated in millions of US dollars.

²A Student-t and Wilcoxon Signed Rank test are used to test whether the means and medians, respectively, are significantly different from zero for the variables R, UR, REC and EXRT.

*Significant at the $\alpha = 0.05$ level.

**Significant at the $\alpha = 0.01$ level.

Descriptive statistics for the final sample are provided in Table 2. The average value of the reconciliation is negative and highly significant. This finding indicates that for the sample firms and time period analysed, net income based on US GAAP was on average less than net income based on non-US GAAP. Firm size, as measured by the market value of equity, ranges from a relatively modest \$416,700 to over \$47bn. The inclusion of small firms enhances the generalisability of the results across firms.

Panel B of Table 2 provides a correlation matrix for the variables in the regression equation, including the market value deflator. A significant correlation exists between the change in the reconciliation component of earnings (UR) and the market-adjusted return (R), providing preliminary evidence that the reconciliation is informative to the market. In addition, the exchange rate fluctuations appear to influence the returns. Multicollinearity among the independent variables is not a concern.

The Information Content of the US GAAP Reconciliation

The results from estimating equation (3) are presented in Table 3. Standard errors were calculated using the White's corrected covariance matrix in all cases where a Breusch-Pagan chi-squared

statistic indicated heteroscedasticity was present in the model. The coefficient for UR (β_1) is significantly positive at the $\alpha = 0.01$ level, indicating that the US GAAP reconciliation is informative to the market at the time of its release.¹⁴ The positive sign is expected since an increase (decrease) in earnings due to reconciling to US GAAP should provide a positive (negative) stock reaction. The positive sign for β_2 supports the no-arbitrage condition that stock prices react to foreign exchange rate fluctuations. The magnitude of the coefficient is not significantly different from 1, which suggests that most of the effect of exchange rate changes is exhibited on US prices for these firms.

Another potential econometric problem is the possible existence of cross-sectional correlation, which results in inconsistent OLS parameter estimates. To control for this problem, Bernard (1987) suggests estimating annual regressions and using the resulting coefficients in calculating a mean,

¹⁴When the seven firm-year observations with extreme UR are retained, the β_1 coefficient becomes significantly negative. This unexpected result is driven entirely by one firm—Saatchi & Saatchi. In other words, when the other five extreme UR observations are included in the regression, β_1 has a value of 0.1072 and a strong t-statistic of 4.9. When the two Saatchi & Saatchi observations are added, the coefficient becomes -0.0124 with a t-statistic of -2.64.

Table 3
Regressions of Equally Weighted Market Adjusted Returns on the Unexpected Portion of the Reconciliation¹

	$R_{it} = \beta_0 + \beta_1(UR_{it}) + \beta_2(EXRT_{it}) + \epsilon_{it}$				
	β_0	β_1	β_2	Adj. R^2	N
Pooled results	-0.0022 (-0.829)	0.0870** (2.59)	0.8794** (4.10)	0.0349	558
Annual mean ²	-0.0025 (-0.579)	0.0851* (2.21)	1.024** (5.08)		

¹The dependent variable is a CRSP equally weighted market return over a 5-day period surrounding the filing date of the 20-F with the SEC; UR is the change in the total reconciliation adjusted for foreign currency exchange rate changes from year $t-1$ to year t , deflated by the market value of equity at the end of fiscal year t ; EXRT is the percentage change in the relevant foreign currency exchange rates within the event window. T-values are in parentheses and are derived using the White's corrected covariance matrix in all cases when a Breusch-Pagan chi-squared statistic indicates heteroscedasticity is present in the model.

²To control for cross-sectional correlation, individual regressions were run for each year from 1987 to 1991 and an additional regression was estimated for all firm-year observations preceding 1987. The parameter estimates from these six regressions were used to calculate a mean, standard error and a corresponding t-statistic.

*Significant at the $\alpha = 0.05$ level using a one-tailed test.

**Significant at the $\alpha = 0.01$ level using a one-tailed test.

standard error, and corresponding t-statistic. The results from this procedure, presented in Table 3, are similar to the pooled results.¹⁵

In summary, the evidence suggests that the reconciliation provides information to the market at the time the 20-F is filed with the SEC and, therefore, is supportive of the SEC's position that the requirement to provide the US GAAP reconciliation should be retained.

Supplementary Analyses

The results in Table 3 are consistent with the evidence presented in McQueen (1993); however, they differ with the short-window return analyses conducted by Amir et al. (1993). Possible explanations for these different results are: (1) the inclusion of Canadian firms in this study; (2) other differences in the sample for non-Canadian firms; (3) the use of US returns in this study with exchange rate controls; (4) slightly different event windows; and (5) the inclusion of the aggregate reconciliation in levels in Amir et al. Additional regressions were estimated to determine how some of these differences in research design would affect the results in this study.

Table 4 presents results from four additional regressions. Panel A includes the aggregate reconciliation component in the model as an additional

proxy for the unexpected portion of the reconciliation. This model specification can be motivated by results in Brown et al. (1987), which demonstrate that measurement error can be reduced by including multiple proxies for unexpected earnings when evaluating the abnormal returns/unexpected earnings relationship. The coefficient for the aggregate reconciliation is insignificant and the other variables are virtually unchanged.

The sample was then partitioned into two subgroups—a Canadian sample consisting of 150 firm-year observations, and a non-Canadian sample consisting of the remaining observations. Panel B in Table 4 contains the regression results on these two subgroups. In addition to demonstrating the effect on the overall results of including Canadian firms in the sample, this partitioning can be motivated by the 'special treatment' the SEC has given Canadian companies through the MJDS discussed in Section 2. Excluding Canadian companies from the sample results in attenuation of the UR coefficient and t-statistic; however, the interpretation that the reconciliation is informative to the market remains the same.

Although the differences between Canadian GAAP and US GAAP are few, the results for the Canadian subgroup suggest that important differences exist and that the reconciliations are informative for these companies, too.¹⁶

¹⁵The UR coefficient for the annual regressions was positive in every year but significant at the $\alpha = 0.05$ level in only one year. The annual regressions suffer from low power due to small sample sizes.

¹⁶The conclusion that Canadian reconciliations are informative to the market contrasts with the results reported in Bandyopadhyay et al. (1994). Differences in methodology and sample may account for these contrasting results.

Table 4
Supplementary Regression Analyses

Panel A: Inclusion of aggregate reconciliation¹

$$R_{it} = \beta_0 + \beta_1(UR_{it}) + \beta_2(EXRT_{it}) + \beta_3(REC_{it}) + \epsilon_{it}$$

	β_0	β_1	β_2	β_3	Adj. R^2	N
Pooled results	-0.0026 (-0.925)	0.1086** (2.79)	0.8672** (3.87)	-0.0545 (-1.44)	0.0325	150

Panel B: Partitioning of data into two subgroups—Canadian and non-Canadian

$$R_{it} = \beta_0 + \beta_1(UR_{it}) + \beta_2(EXRT_{it}) + \epsilon_{it}$$

	β_0	β_1	β_2	Adj. R^2	N
Non-Canadian sample	-0.0009 (-0.362)	0.0673* (1.85)	0.8942** (5.00)	0.0538	408
Canadian sample	-0.0054 (-0.770)	0.1355* (2.06)	0.0934 (0.075)	0.0149	150

Panel C: Alternative event window; non-Canadian sample²

$$R_{it} = \beta_0 + \beta_1(UR_{it}) + \beta_2(EXRT_{it}) + \beta_3(REC_{it}) + \epsilon_{it}$$

	β_0	β_1	β_2	β_3	Adj. R^2	N
Five-day return (-2,2)	-0.0016 (-0.639)	0.0187 (0.457)	0.7097** (4.05)	0.0248 (0.772)	0.0341	408

¹The dependent variable is a CRSP equally weighted market adjusted return from day -1 to day 3, where day 0 is the filing date of the 20-F with the SEC; UR is the change in the total reconciliation adjusted for foreign currency exchange rate changes from year $t-1$ to year t , deflated by the market value of equity at the end of fiscal year t ; EXRT is the percentage change in the relevant foreign currency exchange rates within the event window; REC is the aggregate reconciliation, deflated by the market value of equity. T-values are in parentheses and are derived using the White's corrected covariance matrix in all cases when a Breusch-Pagan chi-squared statistic indicates heteroscedasticity is present in the model.

²The dependent variable is a CRSP equally weighted market adjusted return from day -2 to day 2, where day 0 is the filing date of the 20-F with the SEC; all other variables are defined as before.

*Significant at the $\alpha = 0.05$ level using a one-tailed test.

**Significant at the $\alpha = 0.01$ level using a one-tailed test.

A somewhat surprising result is that the UR coefficient and t-statistic are slightly higher for the Canadian subgroup. A possible explanation for this finding is that the reconciliations for Canadian companies may be more difficult to predict and, therefore, are more informative when they are filed with the SEC. Alternatively, the non-Canadian subgroup contains reconciliations from a diverse set of GAAPs. Presumably, some reconciling items are more informative than others. Forcing a common coefficient for this subgroup may result in a less significant coefficient compared to the more homogeneous Canadian subgroup.

Finally, the results presented in Panel C are from a regression equation that closely resembles the research design presented in Amir et al. (1993); i.e., Canadian firms are excluded from the sample, the aggregate reconciliation is included in the equation, and the event window begins two days before the filing of the 20-F with the SEC and ends

two days subsequent to the filing. In this case, UR becomes insignificant.¹⁷

In summary, including the aggregate reconciliation variable in the regression equation has no effect on the interpretations made in the previous subsection. However, the different results documented in Table 3 of this study and the results presented in Amir et al. can be partially explained by the inclusion of Canadian firms and the use of a different event window in this study.

¹⁷To determine the sensitivity of the results to the definition of the event window, the following three additional event windows were defined and used in the regression equation for the full sample: (1) from one day before to four days after; (2) from 0 days before to four days after; and (3) from two days before to three days after the filing of the 20-F with the SEC. The UR coefficient was significant when using the first two event windows and insignificant in the third case. In all cases where the event window was redefined, corresponding adjustments were made to EXRT.

Summary

This study addresses the issue of whether the release of the reconciliation is incrementally informative. It adds to and extends existing research in this area. This study is distinct from valuation studies since a short-window returns methodology can more readily address the issue of whether the reconciliation is informative. The initial results presented in Table 3 differ from the short-window results documented in Amir et al. (1993) in that the reconciliation variable is significantly correlated with stock returns, suggesting that the US GAAP reconciliation is informative to the market at the time the 20-F is filed with the SEC. Possible reasons identified for the different results were the inclusion of Canadian firms and the use of an alternative event window in this study. Even though Canadian GAAP and US GAAP are similar, results from this study suggest that important differences exist.

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David Solomons and British Accounting

R. H. Parker*

David Solomons had an impact on British accounting in at least five areas: management accounting, accounting education, accounting history, financial accounting theory and accounting standard-setting. I shall not try to cover them all in detail in this memorial but will concentrate on his book *Studies in Costing*, his writings on accounting education and on accounting history, and his report *Guidelines for Financial Reporting Standards*.

Studies in Costing

Studies in Costing (1952) was the second in a trio of path-breaking collections of accounting essays (the first of their kind in the English-speaking world), edited by accounting teachers at the London School of Economics, which commenced with Baxter's *Studies in Accounting* (1950) and continued, after Solomons' book, with Littleton and Yamey's *Studies in the History of Accounting* (1956). As Baxter stated in the introduction to the 1950 volume, those who studied or taught accounting at that time were 'sadly handicapped by a shortage of good reading' (p. iii). All three volumes provided such reading in abundant measure. Solomons once advised the present writer to produce only one volume of readings (as distinct from a collection of one's own papers) but to make it a good one. He followed his own advice. *Studies in Costing* is not only the first collection of readings in its area, but the best and, in Edey's (1995) words, of 'seminal importance'.

The criteria Solomons used for inclusion can be strongly recommended to all anthologists. He set them out in the preface as follows: a high standard of thought and expression; relative inaccessibility; and a lack of overlap with other contributions. He deliberately devoted a liberal amount of space to case studies by practitioners.

The best known paper in the collection is probably Solomons' own 'The Historical Development of Costing' (discussed further below). Other notable inclusions, which have now themselves become part of the history of cost accounting, are R. H. Coase's 'Business Organisation and the

Accountant' and three papers by R. S. Edwards on 'The Rationale of Cost Accounting', 'Cost Accounting and Joint Production' and 'The Approach to Budgetary Control'. All four were originally written in the 1930s but were still challenges to the conventional wisdom of the 1950s. The last two were 'rescued' by Solomons from the now forgotten journal *The Practising Accountant and Secretary*.

Many of the essays in *Studies* were originally intended for a book (never published) by Edwards, Solomons and George Thirlby that was to contain 'the LSE gospel on cost and management accounting'. The application of that gospel is clearly apparent in Solomons' other paper in the collection: 'Cost Accounting and the Use of Space and Equipment'. The idea for this paper came to him, he tells us, when he was having lunch in the cafeteria of the D. H. Evans department store in Oxford Street, London (1984, Vol. 2, pp. xiii–xiv).

Accounting education

Looking back from the 1990s it is difficult to imagine how appalling the state of British (and especially English) accountancy education was when Solomons returned from the War to become a lecturer in accounting at the London School of Economics in 1947. This was the year when full-time professors of accounting were appointed in the UK for the first time: William Baxter at LSE (from 1 May) and Donald Cousins at Birmingham (from 1 October). There were no other full-time professors of accounting until Solomons himself took up a chair at Bristol in 1955. Harold Edey became the second full-time professor at LSE in 1962; David Flint became the first full-time professor in Scotland at Glasgow in 1964. Only in the late 1960s did the number of chairs begin to increase. *Accounting Research*, the UK's first academic accounting journal, started publication under the auspices of the Society of Incorporated Accountants in 1948, but it was closed down in 1958 after the Society was integrated with the three Chartered Institutes.

The faults of British (and especially English) accountancy education were many in the 1950s and were forcefully pointed out by Solomons in his inaugural lecture at Bristol University delivered on

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8 December 1955 and reprinted in *The Accountant* of 28 January and 4 February 1956. Baxter (1995) has rightly described this lecture as 'thoughtful and courageous—a real bombshell'. It was given four weeks after the then president of the English Institute, W. S. Carrington, had stated at an official dinner in Bristol attended by Solomons that he could foresee 'grave dangers unless university lecturers and professors are careful to avoid feeding their students with arguments and propositions which they are not mature enough fully to appreciate or even digest properly' (*The Accountant*, 19 November 1955, pp. 589–90). Solomons commented sharply in his inaugural that 'the critical discussion of accepted ideas is one of the principal purposes for which universities exist. If received doctrine is not to be questioned there, who is to question it?' (1956, p. 120).

Solomons was speaking at a time when only 10% of those qualifying as new members of the Institute of Chartered Accountants in England and Wales (ICAEW) were graduates (Solomons, 1956, pp. 85–6). He contrasted this with the legal profession in England and the accountancy profession in the US and other countries.

He was scathing about correspondence courses, finding it 'utterly incomprehensible that any profession should think it other than a third-rate substitute for real education' (1956, p. 117). His suggestion for reform was a compulsory relevant degree followed by three years of practical training, the last six months of which would be spent in a professional training school, employing personal not correspondence tuition.

Solomons' ideas found no echo in the report of the ICAEW's Parker committee on education and training of 1961. This disastrous, backward looking document (drawn up by those who because they had succeeded under the existing system could apparently see no reason to change it) helped to ensure that accountancy did not develop in British universities as rapidly as it did, for example, in Australia in the very decade that ample money was available from the state for all forms of university education.

Solomons, by then in the US, wrote a devastating critique of the report. It represented to him the 'failure of a mission' and a 'completely inadequate response' (Solomons, 1961). Its recommendation for continued reliance on correspondence courses would keep English accountancy in a 'unique state of educational backwardness'. The report was in his view notable only for its timidity and was full of specious reasoning.

It took some time for the leaders of the British (and especially the English) profession to realise how badly they had been served by the Parker Report. It is to their credit that they eventually turned to Solomons for advice and an indication of his continuing concern for the UK profession (in

spite of his increasingly successful career in his country of adoption) that he was willing to take a year's leave of absence from the University of Pennsylvania during 1972/73, to direct the Long Range Enquiry into Education and Training for the Accountancy Profession and to produce the report *Prospectus for a Profession* (Solomons, 1974).

The report was a thoroughly researched, well-written document which, *inter alia*, surveyed the development of accounting education in Great Britain and Ireland since 1853 and analysed education and training in other British professions, and in the US, Canada, Australia and France. The report's principal recommendation was a basic relevant education at a university or polytechnic leading to a Diploma of Higher Education or a degree.

The report received a rather lukewarm welcome from both the profession and academics. As Solomons himself stated: 'At the most, it caused a few ripples' (1984, Vol. 2, p. xv). He remained disenchanted with the English Institute's educational policies, claiming in 1981 that at least as regards its non-accounting graduates 'the Institute will enter its second century with an educational system . . . not too different from that with which it began its existence in 1880' (1981, p. 142). The reason was the emergence of private sector firms with which several of the big practising firms had recently (at the date of his report) entered into arrangements. It is these firms which have been a decisive factor in enabling the ICAEW to retain practitioner control over education and certification (Geddes, 1995, p. 305).

Most of Solomons' criticisms of English accountancy education were directed at the ICAEW rather than the universities but his recommendations depended heavily not only on a sufficient number of academic accountants but also on their willingness to see themselves as educators for a profession. English universities have, however, seldom favoured commercial education and some accounting teachers in them have attempted to achieve academic recognition by distancing themselves from practice.

Accounting history

Although Solomons was not primarily an accounting historian, his paper on 'The Historical Development of Costing' published in *Studies in Costing* in 1952 is an outstanding statement of what was later to be regarded as the conventional wisdom in its area and it continues to be cited and discussed. The paper was a very thorough piece of research which not only took account of previous work (notably by Solomons' colleague and mentor at the LSE, Ronald Edwards) but also reported the results of a comprehensive search of the literature

on cost accounting and of correspondence with those pioneers of cost accounting still alive at the time Solomons was writing. He put on record the biographical information he so obtained in a paper read at the University of Mississippi in 1993 and published posthumously in *The Accounting Historians Journal*.

Solomons' argument that there was a 'costing renaissance' in the English speaking world during the last three decades of the 19th century and that the most important reason for this was the increasing difficulty of price fixing in the engineering industry has been challenged in recent years. A number of researchers have shown that cost accounting practice was more widespread and more advanced during the British Industrial Revolution than Solomons believed to be the case but they have not been able to improve on his search of the primary literature. British and French researchers are also now tackling the question Solomons posed as to why 'French writers . . . , during the first 60 years or so of the 19th century, carried forward the study of industrial accounting at a time when, as the premier industrial country of the time, England might have expected to lead the way' (1952, p. 12).

Much less well-known (perhaps because it was written for the *Lloyds Bank Review*) is Solomons' 1957 lively review article of *Studies in the History of Accounting* (1956). Solomons is rightly appreciative of the high quality of the contributions to *Studies in the History of Accounting* but does not hesitate to disagree with such distinguished contributors as Geoffrey de Ste. Croix and Raymond de Roover whose papers remain today classics on, respectively, Greek and Roman accounting and on double entry before Pacioli. For example, commenting on de Ste. Croix's view that the introduction of double entry is bound up with the spread of Hindu-Arabic numerals he points out that it was just as true for Roman numerals as for Hindu-Arabic that the speed with which a clerk could add on an abacus would be considerably increased if, instead of having to search in a narrative account for the figures he wanted, the figures were systematically set down in columns. Again, he points out that although economic backwardness may explain lack of refined accounting methods it is much more doubtful if the argument can be turned round ('a pirouette which de Roover skilfully executes') to make lack of refined accounting methods a contributing factor of economic backwardness.

Guidelines for Financial Reporting Standards

It is typical of Solomons' continuing willingness to serve the British accountancy profession that there

are two 'Solomons Reports', not just one. The second was published in 1989 under the title *Guidelines for Financial Reporting Standards*. It was commissioned by the Research Board of the Institute of Chartered Accountants in England and Wales during the period when Bryan Carsberg was the Institute's director of research. The title page describes it as being 'addressed' to the Accounting Standards Committee. It was acknowledged by the ASC as an important set of guidelines to which reference would be made as appropriate. The ASC was replaced in 1990 by the Accounting Standards Board which has based its draft *Statement of Principles* fairly directly on the International Accounting Standards Committee's *Framework for the Preparation and Presentation of Financial Statements Standards* (1989).

All these documents owe much to the US conceptual framework project in which Solomons was closely involved, particularly in the preparation of Statement of Financial Accounting Concepts No. 2 on the qualitative characteristics of accounting information.

Guidelines is clearly strongly influenced by the US framework but is notable in rejecting historical cost accounting and for its illustrations of how the *Guidelines* could be used. Whittington (1994) has traced the development of Solomons' thought on price change accounting, showing how starting from a replacement cost approach he eventually came to favour value to the business as the valuation base but constant purchasing power as the capital maintenance concept. Solomons was well aware of the difficulties of using conceptual frameworks to solve particular problems. He ran into criticism when in an Appendix to the *Guidelines* he argued that his *Guidelines* supported the immediate write off of purchased goodwill against the alternative of carrying it in the balance sheet and amortising it.

Remaining an Englishman

Throughout his career Solomons gave to the British accountancy profession more than it either deserved or understood. Although succumbing in part to 'temptations to belong to other nations' (he took out US citizenship in 1976—an interesting year to choose), it was, in the words of Gilbert and Sullivan, 'greatly to his credit' (and Britain's good fortune) that in so many ways he 'remained an Englishman'. It was his British upbringing that ensured he continued to write good plain English and to insist on it for the many papers he refereed for *Accounting and Business Research* and other journals.

As one of the most well-travelled of accounting academics he could see more clearly than most the

virtues and vices of both the country of his birth and the country of his adoption:

'To know only one country is not to know it well, for judgment, like measurement, always implies comparison' (1984, Vol. II, p. xvi).

He valued recognition in Britain, expressing great pleasure, for example, when he was awarded the Walter Taplin Prize for his paper on the political implications of accounting and accounting standard-setting in the Spring 1983 issue of *Accounting and Business Research*. In 1989 the ICAEW conferred its International Award upon him (*Accountancy*, August 1989, pp. 14–15).

He visited England almost every year, usually staying at the London Business School and making full use of London's cultural facilities. On one visit he received an honorary degree from the University of Buckingham. Having kept up the necessary contributions he received a UK state pension from the late 1970s onwards. Never did the British state receive better value for money.

Solomons did not provide short-term solutions or trim his recommendations to what his audience wanted to hear. His long-term impact on British accounting is likely to be a fruitful study of research for the accounting historians of the future, but one can already say: *Si monumentum requiris, circumspice*.

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David Solomons (1912–1995)—An Appreciation

Stephen A. Zeff*

David Solomons was one of a kind. He had a major impact on policy deliberations, and often on policy itself, in standard-setting, financial reporting and in educational preparation for the profession, on both sides of the Atlantic. At the same time, he made many admirable and important contributions to the research and professional literature, and he headed associations of accounting academics in two countries.

His many writings are models of scholarship, logical development and careful writing. He had the remarkable ability to translate complex notions into simple, understandable terms, accessible to a wide audience. He cared about the role that accounting information plays in society, and he believed deeply in the importance of rational discourse in the literature. Above all, he was a gentleman, and was possessed of a wry sense of humour.

David Solomons was born in London on 11 October 1912. He was educated at Hackney Downs School and at the London School of Economics (LSE), receiving a BCom degree in 1932. He was admitted as an Associate of the Institute of Chartered Accountants in England and Wales in 1936. From that year until 1939, he practised with a London firm, Lawrence Robson & Co. (now Robson Rhodes). During the war, he served with the British Army in the North African campaign. In June 1942, he was captured, and he spent the next two and three-quarter years as a prisoner of war in internment camps in Italy and Germany. Being a university graduate with a professional qualification, and being slightly older than many of the other officers, he gave lectures in accounting and economics and served as an administrator of the camp educational programme. He later wrote that, in April 1945, when he was released, 'I had become an educator' (Solomons, 1984, Vol. 1, p. xiv; 'Redefining Post Retirement Benefits', 1989).

On 14 September 1945, following a brief courtship, he married Kate Miriam Goldschmidt.

In 1946, with the encouragement and support of Professor Arnold Plant, who had been his teacher during undergraduate days, Solomons returned to the LSE as a part-time lecturer, while working for his old firm on Fridays. However, on the sudden death of Stanley W. Rowland, he became the only teacher of accounting, both in the daytime and evening schools, until William T. Baxter arrived the following year from the University of Cape Town to become the LSE's (and Britain's) first full-time professor of accounting. In 1948, Solomons was appointed reader in accounting, and from 1947 to 1950 he was founding secretary of the Association of University Teachers of Accounting (AUTA), known today as the British Accounting Association.

At the LSE, Solomons acquired a mentor in Ronald S. Edwards, and was especially influenced by the latter's work in income measurement (see Edwards, 1938). Throughout Solomons' career, one could discern the influence of the LSE research culture on his thought and writing, in which he sought to bring economic reasoning to accounting questions (see, for example, Solomons, 1955).¹ Much of his published work then was on management accounting, and in 1952 he edited a collection of articles entitled *Studies in Costing*, to which he contributed a pioneering essay on 'The Historical Development of Costing'.² It was the first reader on cost accounting published in the English language. A revised edition appeared in 1968 under the title, *Studies in Cost Analysis*.

In 1955, he was appointed the first professor of accounting at the University of Bristol, and in 1958 he served as chairman of the AUTA. In his eloquent inaugural address at Bristol (1956), he derided the English Institute's cherished system of articles and correspondence tuition, and advocated that, in its place, entrants to the Institute be required to complete three years of university study in economics, accounting and law, followed by

¹For accounts of the intellectual climate prevailing at the LSE during the 1930s and 1940s, see Gould (1974) and Coase (1990).

²All of Solomons' articles prior to 1984 that are cited in this obituary are reproduced in the anthology that he published in that year.

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three years of office work interspersed with periods of full-time practical training. As he acknowledged in his address, this was indeed a radical proposal. His lecture hit like a 'bombshell', and it was said that his plea 'greatly offended conservative accountants' (Obituary, 1995). The Institute, then a picture of petrification as a professional body, ignored Solomons' advice.

In 1959, partly owing to his discouragement over the state of accounting education in Britain, Solomons moved to the US to become professor of accounting at the Wharton School of the University of Pennsylvania. Two years later, he wrote an article that was devastatingly critical of the English Institute's Parker Committee Report on Accounting Education and Training (1961). The Parker Committee was safely under the control of the Institute's establishment: six of its 11 members were past presidents or would soon become presidents, including its chairman, W. E. Parker, a senior partner of Price Waterhouse & Co. Its recommendations followed the Institute line. Solomons found the Committee's characterisation of the principal as being akin to a parent 'to be pure mysticism and not a rational judgment at all', and his roll of other professions 'none of whom confuse the force of example with parenthood' would have given little comfort to the Committee. Years later, Solomons said that 'Writing my 1961 piece for *Accountancy* attacking that report gave me more satisfaction, I think, than anything else I have written' (1984, Vol. 2, p. xv).

Solomons' 1956 and 1961 articles signalled the end of a long era of unquestioned reliance on the system of articles for the education and training of English chartered accountants. Beginning in the 1960s and continuing into the 1970s, programmes of management and accounting education were established in English and Welsh universities, partly propelled by the Robbins and Franks Reports on higher education and management education, respectively. In his 1956 and 1961 articles, Solomons prophetically argued that formal education should play an important role in the preparation of chartered accountants. His contention that the Committee placed excessive emphasis on examination study instead of on the quality of the learning experience would bear repeating today.

While at Bristol, Solomons' interest in financial accounting theory had begun to intensify. He was much impressed with Sidney Alexander's monograph, 'Income Measurement in a Dynamic Economy' (1950), which, in a vein similar to that of Ronald Edwards' 1938 article, propounded an economist's framework for evaluating the accountant's income, not only under conditions of certainty but also under conditions of uncertainty. Solomons later wrote, 'I have always thought, and still think, that Alexander's monograph is one of

the most incisive discussions of income ever written, and I wanted to give it wider circulation' (Solomons, 1984, Vol. 1, p. xv).

His revision of the Alexander monograph, with the author's approval, was published in Baxter and Davidson (1962). In 'Economic and Accounting Concepts of Income' (1961), his first major article on financial accounting theory, Solomons concluded that it was not operationally feasible to separate changes in expectations from Alexander's 'economic income', thereby diminishing its usefulness as a satisfactory measure of enterprise performance. It was then that he made his famous prediction that 'so far as the history of accounting is concerned, the next 25 years may subsequently be seen to have been the twilight of income measurement' (p. 383).³

In an important essay written in 1966, 'Economic and Accounting Concepts of Cost and Value', Solomons drew on Bonbright (1937) to elaborate on the concept of 'value to the owner' in which he developed an inequality notation that did much to draw attention to this approach to modelling the accountant's asset valuation problem.⁴

In 1965, he wrote his first book, *Divisional Performance: Measurement and Control*, in which he reported on a survey of 25 major companies and presented his own recommendations on how best to evaluate and control decentralised operations. It was a path-breaking study, done at the request of the Financial Executives Research Foundation, and it earned him the Notable Contribution to Accounting Literature Award for 1969, given annually by the American Institute of Certified Public Accountants (AICPA) on recommendation of a committee of the American Accounting Association (AAA). In 1966, the University of London conferred on him the DSc(Econ) in recognition of his published work, in which his book on divisional performance held pride of place.

In the early 1970s, Solomons added standard-setting to his previous interests in accounting history, cost accounting, financial accounting theory and accounting education. Following widespread criticism of the performance of the Accounting Principles Board (APB), in 1970–71 he chaired a special AAA Committee on Establishment of an Accounting Commission. Following issue of the committee's report (1971), in which it analysed the criticisms of the APB's work and recommended the terms of an independent Commission of Inquiry to review the record and propose a course

³Twenty-five years later, he acknowledged that this prediction had not come true, and that perhaps his forte was not as a seer (Solomons, 1987).

⁴Solomons' formulation of 'value to the owner' was further refined by Parker and Harcourt (1969), whose set of six inequalities was used by the Sandilands Committee in the fashioning of its recommendations (*Report of the Inflation Accounting Committee*, 1975, chapters 6, 13).

reform, he was appointed to the AICPA's Study Group on Establishment of Accounting Principles, chaired by Francis M. Wheat, a former member of the Securities and Exchange Commission. It was precisely the kind of commission of inquiry his AAA committee had in mind. A year later, in March 1972, the Wheat Study Group proposed the establishment of the Financial Accounting Standards Board (FASB) to replace the APB. Solomons was the principal draftsman of the Study Group's report (*Establishing Financial Accounting Standards*, 1972), and the shift from 'principles' to 'standards' owed much to his influence.⁵

His role in the Wheat Study Group led to another assignment. In 1977-78, he helped draft the report of the AICPA's Special Committee to Study the Structure of the Auditing Standards Executive Committee, which led to the establishment of the Auditing Standards Board (see Solomons, 1978a).

In 1972-73, Solomons' attention returned to accounting education and to Britain. He took a year's leave from the Wharton School to conduct a Long Range Enquiry into Education and Training for the Accountancy Profession in the UK. That he would have been invited by a committee representing all of the important accountancy bodies in the British Isles to undertake a major study of accounting education and training was an implied acknowledgement of the wisdom of the views expounded in his 1956 and 1961 articles. In 1974, under the title of *Prospectus for a Profession*, he rendered his report (Solomons with Berridge, 1974). Known as the Solomons Report, it was a thoroughly researched and scholarly study with far-reaching recommendations, yet their failure to win favour disappointed him keenly. He later wrote:

'I wish I could say that *Prospectus* . . . had left a deep mark on British accounting education, but I cannot. At the most, it caused a few ripples. It was politely received by the six bodies that had commissioned the study. They then turned their backs on it and went their several ways' (Solomons, 1984, Vol. 2, p. xv).

By the end of the 1980s, however, some of the Solomons Report recommendations were coming to be adopted ('Redefining Post Retirement Benefits', 1989, p. 15).

Solomons has also been on call in Canada. In 1975-76, he prepared a report for the Interprovin-

cial Education Committee on the new comprehensive paper in the Uniform Final Examination (UFE), and from 1986 to 1989 he was a member of the same committee's UFE study group which produced a major report (*Uniform Final Examination Study Group*, 1989), virtually all of whose recommendations were approved and implemented.

In 1974, he was designated the Arthur Young Professor of Accounting at the Wharton School, and in 1976 he became an American citizen.

The AAA was not long in recognising Solomons' ability. In 1968-70, he served as director of research and a member of the executive committee, and in 1977-78 he became its first president born outside of North America. It was no mean achievement for one who came to the US as a mature academic in 1959 to become the leader of the US academic accounting community in a little more than 15 years. He was the first person to have headed both the British and American academic accounting associations.

In 1977, the FASB invited Solomons to become a consultant on its conceptual framework project. He is largely responsible for the drafting of Statement of Financial Accounting Concepts No. 2 (SFAC 2), *Qualitative Characteristics of Accounting Information* (1980), which has been the most widely admired of the Board's concepts statements and has been a foundation-stone for the development of conceptual frameworks in other countries. The term, 'representational faithfulness', which is used in SFAC 2, was a Solomons creation.

In 1978, while he was working on SFAC 2, he began to speak out in support of the principle of 'neutrality' in standard-setting (see esp. Solomons, 1978b), an argument that he continued to press in later writings. To Solomons, 'neutrality', i.e., freedom from politicisation, was indispensable to standard-setting and a conceptual framework. It was he who coined the term.

In 1983, he retired as Ernst & Young Professor at the Wharton School, although his professional service, as well as his writing and lecturing, continued apace.

From 1982 to 1985, he served on the FASB's advisory council, and from 1987 to 1990 he was on the Academic Accounting Panel of the UK/Irish Accounting Standards Committee (ASC).

In 1984, he published a two-volume anthology of his most significant published papers, together with autobiographical notes, under the title, *Collected Papers on Accounting and Accounting Education*.

In an article published in 1986, he gave the FASB low marks for its conceptual framework, and he was severely critical of its statement on recognition and measurement (Solomons, 1986a). Later in the same year, he synthesised his ideas on standard-setting and financial reporting in a

⁵For his views on the Study Group's recommendations, see Solomons (1972). Solomons had preferred 'financial reporting standards' to 'financial accounting standards', but he was out-voted. He has told this writer that, during the Study Group's deliberations, he was unaware that 'standards' had replaced 'principles' in Britain two years earlier.

261-page book, *Making Accounting Policy: The Quest for Credibility in Financial Reporting* (Solomons, 1986b), which is an exemplar of thoroughness, careful scholarship and persuasive writing. In the book, he unveiled his valuation model of 'current cost constant purchasing power accounting', with 'value to the business [formerly "owner"]' as the guiding precept for current cost.⁶

In the 1980s, he continued to be in demand as a lecturer in North America, Europe, Asia and the South Pacific. In 1984, he was the AAA's Distinguished International Lecturer in India and Bangladesh (see Solomons, 1985), and in 1986 he was the Lee Kuan Yew Distinguished Visitor in Singapore.

In 1989, at the invitation of the English Institute's Research Board, he returned to the standard-setting stage by proposing a concise set of broad, conceptual guidelines for the ASC under the title *Guidelines for Financial Reporting Standards*. While the contents of his *Guidelines* were discussed and debated in the journals, its evident impact on policy was attenuated owing to the uncertainty over the ASC's future in the wake of the Dearing Report (*The Making of Accounting Standards*, 1988).

In the late 1980s and early 1990s, he wrote several articles in which he took issue with academics and professionals over criticisms of his *Guidelines*, the relevance of a conceptual framework, the importance of neutrality in the setting of accounting standards, and whether a balance-sheet or income-statement orientation should govern standard-setting. His last theoretical article, in which he reiterated his support for the conceptual primacy of the balance sheet and proposed seven criteria for validating an accounting model, was published posthumously (Solomons, 1995).

In 1989–90, at the age of 77, he undertook the arduous task of chairing the AAA Committee on Accounting and Auditing Measurement, four of whose members, in addition to Solomons, were senior academics or professionals from three countries, of whom two filed minority opinions in the committee's report (AAA, 1991).

He served on the editorial boards of several journals, including *Accounting and Business Research*. He regularly attended the annual meetings of the AAA and the European Accounting Association, and was frequently on the programme of the latter.

In 1980, he was chosen by the AAA as an Outstanding Accounting Educator, and at the end

of the decade he received the 1989 International Award bestowed by the English Institute 'in recognition of his distinguished contribution to the development of the profession in the United States of America and for his work in the development of accounting standards in the United Kingdom and overseas'. This was the ultimate accolade from a body that had evinced no interest in acting on his accounting education reform proposals of 1955/6 and 1974.

In 1992, he was inducted as the 52nd member of The Ohio State University's Accounting Hall of Fame. In his acceptance speech, he deplored the resistance by financial statement preparers to improvements in financial reporting standards. He concluded his speech with the following lament:

'I wish that I could have been more persuasive in my own writing and more successful in helping to change that environment. It is a task that my generation must leave to our successors' (1993, p. 113).

At the AAA annual meeting in August 1995, Solomons was posthumously awarded the 1994–95 Wildman Medal in recognition of his accumulated contributions towards the advancement of the public practice of accountancy.

Solomons died of lymphoma on 12 February 1995 at his home in Swarthmore, Pennsylvania. He is survived by his wife Miriam, daughter Jane and son Jonathan.

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⁶Whittington (1994, chapter 14) has insightfully traced the evolution of Solomons' ideas on price change accounting in relation to those of W. T. Baxter and H. C. Edey. The terms 'value to the owner' and 'value to the business' (introduced in the Sandilands Report) are also known as 'deprival value', which was coined by Baxter (1971, p. 32).

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Book Review

European Financial Reporting Series. Belgium.
Christian Lefebvre and John Flower. Routledge for ICAEW, 1994. xvii + 313 pp. £65.

This book is one in the series of books on financial reporting in Europe, each covering one member state of the European Union. Although the authors have been given a formal structure of subjects to be covered by the editors of the series, they are able to emphasise those matters of interest in their country and are able to add relevant subjects.

The first part of the book covers the business environment in Belgium. This part analyses the political and economic situation, the financial markets and the different forms of business organisations together with the existing company law. It is a pity, however, that when the authors discuss the most important aspects of Belgian company law, they do not mention the articles in which those elements are stipulated. This would enable readers, who want to analyse one item in more detail, to find immediately the relevant part in Belgian company law. At the end of the first part, the main aspects of the Belgian tax system are explained.

The second part of the book deals with accounting, auditing and financial reporting in each member country. The topics covered in this part reflect the typical characteristics of the accounting environment of the country dealt with. This implies that the structure of the second part is different in each book in the series of financial reporting in Europe. As accounting practice and financial reporting in Belgium consist of complying with detailed legislation, which is issued by the government, and as professional organisations hardly issue opinions on accounting problems,

the second part represents mainly a description of accounting law in Belgium.

The first section of this second part is entitled 'Accounting background', and two comments can be made. As there is a tight relationship in Belgium between taxation and financial reporting, it would have been interesting to discuss to a larger extent the interference and connections between these two. The subject of the national chart of accounts, on the other hand, is extensively covered in this part. After this introduction the authors present an overview of existing accounting law and accompanying royal decrees on the individual and consolidated accounts of industrial and commercial companies. The part ends with a chapter on the financial and economic information which has to be communicated to the workers' councils. This communication of financial information to the workforce and the extensive regulation of it by law is typical for the Belgian business environment.

The third part of the book consists of appendices. The authors have chosen to include the following items: illustrative financial statements; a comparison between the EC directives and the Belgian legislation; the text of the law on accounting and the accompanying royal decrees on the individual accounts of a company; and a list of useful addresses. A comparison between Belgian law and international accounting standards, as is found in many other books of the series, is not included here. The book ends with a glossary of accounting terms in three languages: Dutch, French and English.

Overall, this book provides a good overview of the business environment, accounting regulation and accounting practice in Belgium.

University of Antwerp

Ann Jorissen

Guide for Authors

General

Papers should be in English and consist of original unpublished work not concurrently being considered for publication elsewhere. They should be typed and double-spaced. *Four* copies should be submitted together with a submission fee of £18 for subscribers or £36 for non-subscribers. In order to ensure an anonymous review, authors should not identify themselves directly or indirectly. Experience has shown that papers which have already benefited from critical comment from colleagues at seminars or at conferences have a much better chance of acceptance. Where the research takes the form of field surveys or experiments, *four* copies of the instrument should be submitted. Where the paper shares data with another paper, *four* copies of the other paper must also be provided.

Presentation

A cover page should show the title of the paper, the author's name, title and affiliation, and any acknowledgements. The title of the paper, but not the author's name, should appear on the first page of the text. An Abstract of 150–250 words should be provided on a separate page immediately preceding the text.

Tables and figures

Each table and figure should bear a number and a title and should be referred to in the text. Sources should be clearly stated. Sufficient detail should be provided in the heading and body of each table and figure to reduce to a minimum the need for cross-referencing by readers to other parts of the manuscript. Tables and figures should appear at the end of the paper, with its most appropriate placing noted in the paper itself.

Footnotes

Footnotes should be used only in order to avoid interrupting the continuity of the text and should not be used to excess. They should be numbered consecutively throughout the manuscript with superscript arabic numerals. They should not be used in book reviews.

References

References should be listed at the end of the paper and referred to in the text as, for example, (Zeff, 1980, p. 24). Wherever appropriate, the reference should include a page or chapter number. Only works cited in the paper should be included in the list. Citations to institutional works should if possible employ acronyms or short titles. If an author's name is mentioned in the text it need not be repeated in the citation, e.g. 'Whittington (1986, p. 6) states ...'

In the list of references titles of journals should omit an initial 'The' but should not otherwise be abbreviated. The entries should be arranged in alphabetical order by surname of the first author. Multiple works by the same author should be listed in chronological order of publication. Some examples are:

Accounting Standards Steering Committee (1975), *The Corporate Report*.

Ashton, D. J. (1986), 'Goal Programming and Intelligent Financial Simulation Models, Part 2', *Accounting and Business Research*, Spring.

Watts, R. L. and Zimmerman, J. L. (1986), *Positive Accounting Theory* (Englewood Cliffs, NJ: Prentice-Hall).

Style and spelling

Abbreviations should be written as, for example, FASB and not F.A.S.B. Words such as 'realise' should be spelt with an 's' not a 'z'. Single quotations marks should be used, not double.

Mathematical notation

Mathematical notation should be used only where it adds rigour and precision, and should be properly explained in the text. Equations should be numbered in parentheses, flush with the right-hand margin.